

Travis Eiva (OR Bar 052440)
Zemper Eiva Law LLC
101 East Broadway, Suite 303
Eugene, OR 97401
travis@zempereiva.com
Tel: 541-636-7480

Erin J. Zemper (OR Bar 044628)
Zemper Eiva Law LLC
101 East Broadway, Suite 303
Eugene, OR 97401
erin@zempereiva.com
Tel: 541-636-7480

*Attorneys for Amici Curiae
League of Women Voters of the United States and
League of Women Voters of Oregon*

UNITED STATES DISTRICT COURT

DISTRICT OF OREGON

EUGENE DIVISION

**KELSEY CASCADIA ROSE JULIANA;
XIUHTEZCATL TONATIUH M.**, through
his Guardian Tamara Roske-Martinez; et al.

Case No.: 6:15-cv-01517-TC

Plaintiffs,

AMICI CURIAE BRIEF IN SUPPORT OF
PLAINTIFFS

v.

**The UNITED STATES OF AMERICA;
BARACK OBAMA**, in his official capacity as
President of the United States; et al.,

Federal Defendants.

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AMICI CURIAE BRIEF IN SUPPORT OF PLAINTIFFS

I. IDENTITY AND INTEREST OF *AMICI CURIAE*¹

The League of Women Voters of the United States (“LWVUS”) is a grassroots, nonpartisan, nonprofit organization that encourages informed, active, and inclusive participation in government in order to promote political responsibility and to better serve the democratic interests and principles of *all* peoples of the United States, including underrepresented groups. LWVUS’s primary focus and activities consist of: (1) protecting voters by ensuring that *all* voters – particularly those from traditionally underserved or underrepresented demographics, including young adults, new citizens, and minorities – have the opportunity and information to exercise their vote; (2) educating and engaging voters by assisting and encouraging voter registration, education with respect to candidates and their positions, and voter turnout; (3) reforming the influence of money in politics through reclaiming our nation’s campaign finance system in order to increase governmental transparency, combat corruption, and maximize citizen participation in the political process; and (4) protecting the environment by supporting legislation that seeks to protect our country from the physical, economic, and public health effects of climate change while providing pathways to economic prosperity. LWVUS’s believes that climate change is the greatest environmental challenge of our generation and that averting the damaging effects of climate change requires actions from both individuals and governments at local, state, national, and international levels. In raising awareness and advocating for solutions

¹ The Federal Defendants take no position on whether *amici curiae* should be allowed to participate in this case. The Intervenor-Defendants likewise take no position on whether *amici curiae* should be allowed to participate in this case. Plaintiffs consent. No counsel for any party authored this brief in whole or in part, no such counsel or party made a monetary contribution to fund the preparation or submission of this brief, and no one other than the *amici curiae* and their counsel made any monetary contribution.

to climate change and its impacts, LWVUS supports legislative solutions and strong executive branch action, and works to build grassroots support for action on climate change nationally and at the state and local levels to avoid irrevocable damage to our planet.

The League of Women Voters of Oregon (“LWVOR”) is also a grassroots, nonpartisan, nonprofit organization. LWVOR shares LWVUS’s primary mission and focus of ensuring effective representative government through voter registration, education, and mobilization and works to ensure that the voices and interests of all individuals, particularly those underrepresented in government, are spoken and accounted for in political decision-making. Additionally, like LWVUS, LWVOR works to advocate for sound environmental policy. Since the 1950s, LWVOR has been at the forefront of efforts to protect air, land, and water resources. LWVOR’s members work to preserve the physical, chemical, and biological integrity of the ecosystem, with maximum protection of public health and environment. LWVOR’s Social Policy directs members to secure equal rights and equal opportunity for all as well as promote social and economic justice and the health and safety of all Americans. Additionally, LWVOR’s position on climate change is that global climate change is one of the most serious threats to the environment, health, and economy of our nation. Recent scientific studies show that global warming is already causing environmental changes that will have significant global economic and social impacts.

Focused as they are on engaging citizens to participate in the democratic process to ensure that the interests of *all* Americans are represented in a transparent, participatory, and politically accountable government, and respecting the proper role of each branch of government, *amici* direct their limited efforts at effectuating change primarily through the legislative and executive branches. However, where appropriate in certain limited

circumstances, *amici* recognize that judicial involvement is necessary to safeguard the fundamental rights of underrepresented individuals when the other branches have failed them. In such limited circumstances, *amici* participate in litigation in order to see that the interests of representative democracy are served. To that end, *amici* have occasionally, but sparingly, joined in suits or filed amicus briefs in cases, primarily with respect to disputes in which the voting rights of individuals have been infringed², but *also* in similar cases, such as this one, in which other fundamental rights of underrepresented groups have been adversely impacted.³

Amici file this brief in support of the Youth Plaintiffs in this case to emphasize that Youth Plaintiffs' claims do not implicate the political question doctrine and, accordingly, it is the constitutional duty of the judiciary to exercise its jurisdiction over this case. It is the role of the courts, in keeping with the separation of powers, to serve as a check and balance to the legislative and executive branches, particularly when their actions, as here, have infringed upon the fundamental rights of individuals.

II. SUMMARY OF ARGUMENT

In the foundational U.S. Supreme Court case of *Marbury v. Madison*, Chief Justice Marshall wrote that “[t]he very essence of civil liberty consists in the right of every individual to claim the protection of the laws, whenever he receives an injury. One of the first duties of

² See, e.g., Brief of Amici Curiae Common Cause, League of Women Voters of the United States and Project Vote, Inc., In Support of Appellants, *Ohio A. Philip Randolph Institute, et al. v. Husted*, No. 16-3746 (6th Cir.) (Appeal regarding Ohio’s removal of voters from voter roles under National Voter Registration Act) *available at* <http://lww.org/files/Filed%20Amici%20Curiae%20Brief%20-%20Common%20Cause%2C%20LWV%2C%20Project%20Vote.pdf>; *League of Women Voters v. Newby*, No. 16-236 (RJL) (D.D.C. June 29, 2016) (Challenge to HB 589 as voter suppression bill); and *League of Women Voters of the United States v. Fields*, 352 F.Supp. 1053 (E.D. Ill. 1972) (Challenge to discrimination in voter registration practices).

³ See Brief of League of Women Voters of Oregon, et al., as Amici Curiae in Support of Plaintiffs-Appellants, *Chernaik v. Brown*, No. A159826 (Or. Ct. App.) (Mar. 3, 2016).

government is to afford that protection.”⁴ This general principle applies notwithstanding the political question doctrine, a narrow canon of justiciability, rooted in the separation of governmental powers and the duty of each branch to serve as a check and balance on coordinate branches.⁵ Where the legislative and executive branches have, as here, failed to protect the fundamental liberties of citizens, and have, as here, actively infringed upon those rights, the very separation of powers concerns on which the political question doctrine is based mandate that the judiciary fulfill its role to serve as a check and balance to protect the rights of individuals.⁶

The political question doctrine holds that unless one of the following factors is “*inextricable* from the case at bar, there should be no dismissal for non-justiciability on the ground of a political question’s presence”: (1) a “textually demonstrable constitutional commitment of the issue to a coordinate political department”; (2) “lack of judicially discoverable and manageable standards for resolving it”; (3) “the impossibility of deciding without an initial policy determination of a kind clearly for nonjudicial discretion”; (4) “the impossibility of a court’s undertaking independent resolution without expressing the lack of respect due coordinate branches of government”; (5) “an unusual need for unquestioning adherence to a political decision already made”; or (6) the potential of embarrassment from multifarious pronouncements by various departments on one question.”⁷ As explained below,

⁴ 5 U.S. (1 Cranch) 137, 163 (1803).

⁵ *Baker v. Carr*, 369 U.S. 186, 217 (1962) (The political question doctrine is “essentially a function of separation of powers.”).

⁶ *Bowsher v. Synar*, 478 U.S. 714, 721 (1986) (“The declared purpose of separating and dividing the powers of government, of course, was to diffuse power the better to secure liberty.”); *Nat’l Labor Relations Board v. Canning*, 134 S. Ct. 2550, 2593 (2014) (Scalia, A., concurring) (Explaining that the separation of powers exists to safeguard individual liberties and that “policing the enduring structure of constitutional government when the political branches fail to do so is one of the most vital functions of this Court.”) (internal quotations and citations omitted).

⁷ *Baker*, 369 U.S. at 217 (emphasis added).

none of these concerns is present in Youth Plaintiffs' case.⁸ Youth Plaintiffs simply call upon this Court to exercise its paramount authority under the Constitution to decide claims of infringement of individual rights.⁹ The exercise of this duty is especially necessary in light of the latest and best available science regarding the current and projected impacts of climate change.

III. ARGUMENT

A. Introduction

The climate crisis threatens the very survival of future civilization, with increasingly severe impacts projected to befall youth and future generations in a progressively pronounced manner. Like disenfranchised plaintiffs in voting rights cases, those who stand to be most severely impacted by climate change – youth and posterity – cannot adequately assert their interests through the system of representative government. Despite government knowledge of the dangers of climate change dating back more than fifty years, the legislative and executive branches have failed to take appropriate action to protect the rights of youth and future generations from infringements associated with climate change. Quite the opposite, the legislative and executive branches have actively and knowingly exacerbated the dangers of climate change and its effects on the fundamental rights of youth and posterity by permitting, encouraging, and enabling the continued exploitation, production, and combustion of fossil fuels. Where the legislative and executive branches have placed in peril the fundamental rights of

⁸ The Federal Defendants have not argued that Youth Plaintiffs' claims implicate a political question. Intervenor-Defendants' political question arguments focus on formulations 1, 2, and 4 (*See* Memorandum In Support of Intervenor-Defendants' Motion to Dismiss, Dkt. 20, 11-16 (Int. MTD); Reply In Support of Intervenor-Defendants' Motion to Dismiss, Dkt. 59, 10-14 (Int. Rep.); and Intervenor-Defendants' to Magistrate's Findings and Recommendations, Dkt. 73, 21-28). Accordingly, amici focus their analysis on those factors.

⁹ *Marbury*, 5 U.S. (1 Cranch) at 177 ("It is emphatically the province and duty of the judicial department to say what the law is.")

individuals who are unable to protect their own interests through representational government, as here, it is the duty of the judicial branch to exercise its constitutional mandate and authority to exercise its jurisdiction.¹⁰

B. The History of the Political Question Doctrine

The Supreme Court first delineated a narrow and clear conception of the political question doctrine in *Marbury v. Madison*.¹¹ The Court articulated a clear delineation of circumstances in which a case presents a nonjusticiable political question: “By the Constitution of the United States, the President is invested with certain political powers, in the exercise of which he is to use his own discretion, and is accountable to his country only in his political character, and to his own conscience.... The subjects are political. They respect the nation, not individual rights, and being entrusted to the executive, the decision of the executive is conclusive....”¹² The Court made clear that “[t]he province of the Court is, solely, to decide on the rights of individuals, not to inquire how the executive, or executive officers, perform duties in which they have a discretion. Questions, in their nature political, or which are by the Constitution and laws, submitted to the executive, can never be made in this Court.”¹³ By contrasting purely political matters constitutionally delegated to executive discretion with individual rights dependant on legal duties, Chief Justice Marshall established under *Marbury* that questions in which individual rights are at issue could never be political questions, while

¹⁰ *Bowsher*, 478 U.S. at 721 (“The declared purpose of separating and dividing the powers of government, of course, was to diffuse power the better to secure liberty.”); *Marbury*, 5 U.S. (1 Cranch) at 163 (“The very essence of civil liberty certainly consists in the right of every individual to claim the protection of the laws, whenever he receives an injury.”).

¹¹ 5 U.S. (1 Cranch) at 163.

¹² *Id.* at 165-66.

¹³ *Id.* at 170.

those involving purely discretionary political acts might.¹⁴ Under *Marbury*, “[i]f a litigant claims that an individual right has been invaded, the lawsuit by definition does not involve a political question.”¹⁵ Magistrate Judge Coffin used this precise language in his Order and Findings & Recommendations, finding that this case does not present a political question.¹⁶

After the pronouncement of the test enunciated in *Marbury* delineating political questions from those involving the vindication of *individual* rights, in subsequent cases, the Court found nonjusticiable political questions in a series of challenges involving the Guarantee Clause.¹⁷ One commentator has characterized at least one of these cases as finding a nonjusticiable political question “when individual rights [were] implicated.”¹⁸ However, it is noteworthy that the Guarantee Clause’s text expressly states that “[t]he United States shall guarantee to every *State* in this Union a Republican form of government...”¹⁹ In contrast, Youth Plaintiffs’ claims arise from violations of the Fifth, Ninth, and Fourteenth (as applicable to the Federal Government through the Due Process Clause of the Fifth) Amendments, and the public trust doctrine²⁰, the

¹⁴ *Id.*

¹⁵ Erwin Chemerinsky, *Federal Jurisdiction*, § 2.6 n.7 (5th ed. 2007) (quoting Howard Fink & Mark Tushnet, *Federal Jurisdiction: Policy and Practice* 231 (2d ed. 1987)).

¹⁶ See Order and Findings & Recommendation, Dkt. 68, 13 (citations omitted) (Order and Findings).

¹⁷ See, e.g., *Luther v. Borden*, 48 U.S. (7 How.) 1 (1849); *Pacific States Telephone & Telegraph Co. v. Oregon*, 223 U.S. 118 (1912); *Taylor & Marshall v. Beckham*, 178 U.S. 548 (1900); *State of Georgia v. Stanton*, 73 U.S. 50 (1867); but see *New York v. United States*, 505 U.S. 144, 185 (1992) (“More recently, the Court has suggested that not all claims under the Guarantee Clause present nonjusticiable political questions. Contemporary commentators have likewise suggested that courts should address the merits of such claims, at least in some circumstances.”)(citations omitted); *Reynolds v. Sims*, 377 U.S. 533, 582 (1964) (“[S]ome questions raised under the Guarantee Clause are nonjusticiable.”).

¹⁸ See Jared P. Cole, Cong. Research Serv., R43834, *The Political Question Doctrine: Justiciability and the Separation of Powers*, 4 (December 23, 2014) (citing only *Luther v. Borden*, 48 U.S. 1(1849) (underlying right asserted under Guarantee Clause).

¹⁹ U.S. Const. art. IV. § 4.

²⁰ Ample authority exists supporting the existence of public trust rights as fundamental rights arising under the Constitution. Magistrate Judge Coffin’s Order recognized that “the court

provisions and mandates of which apply to the benefit of “person[s]”²¹ and “people,”²² respectively.

Notwithstanding the express language of the Guarantee Clause to the benefit of “every State” rather than to individuals, the citations by *Luther* and its progeny to *Marbury* without apparent adherence to Justice Marshall’s distinction between political questions and individual rights appeared to cause confusion.²³ This confusion is most evident in *Pacific States Telephone & Telegraph Co. v. Oregon*, in which the Court dismissed Due Process, Equal Protection, and Guarantee Clause claims as presenting a political question without reference to the test

should decline to dismiss any notions that the Due Process Clause provides a substantive right under the public trust doctrine.” Order and Findings at 15. See, e.g., Charles Wilkinson, *The Headwaters of the Public Trust: Some Thoughts on the Source and Scope of the Traditional Doctrine*, 19 ENVTL. L. 425, 459 (1989) (Commerce Clause); Karl S. Coplan, *Public Trust Limits on Greenhouse Gas Trading Schemes: A Sustainable Middle Ground?*, 35 COLUM. J. ENVTL. L. 287, 311 (2010) (Tenth Amendment); Gerald Torres & Nathan Bellinger, *The Public Trust: The Law’s DNA*, 4:2 WAKE FOREST J. L. & POL’Y 281, 290, 293, 294 (2014) (Vesting Clause, Preamble, Equal Protection Clause, and Due Process Clause of Fifth Amendment); George P. Smith II & Michael W. Sweeney, *The Public Trust Doctrine and Natural Law: Emanations Within a Penumbra*, 33 B.C. ENVTL. AFF. L. REV. 307 (2006) (Ninth Amendment); Douglas L. Grant, *Underpinnings of the Public Trust Doctrine: Lessons from Illinois Central Railroad*, 33 ARIZ. ST. L.J. 849 (2001) (Reserved Powers Doctrine and Ninth Amendment); see also, *Robinson Township v. Commonwealth of Pennsylvania*, 83 A.3d 901, 928, 947-48 (Pa. 2013) (Holding that the public trust doctrine is “inherent in...and preserved rather than created by the Pennsylvania Consitution” and that the political question doctrine does not prevent adjudication of public trust claims.).

²¹ U.S. Const. amend. V (“[N]or shall any *person*...be deprived of life, liberty, or property without due process of law.” (emphasis added)); U.S. Const. amend. XIV (“[N]or shall any state...deny to any *person* within its jurisdiction the equal protection of the laws.”) (emphasis added).

²² U.S. Const. amend. IX (“The enumeration in the Constitution of certain rights shall not be construed to deny or disparage other retained by the *people*.”) (emphasis added); *Illinois Central R.R. Co. v. Illinois*, 146 U.S. 387, 449 (1892) (The title under which sovereign’s hold public trust resources “is a title held in trust for the *people*...” (emphasis added); *Light v. U.S.*, 220 U.S. 523, 537 (1911) (“All the public lands of the nation are held in trust for the *people* of the whole country.”) (emphasis added); *U.S. v. Trinidad Coal*, 137 U.S. 160, 170 (1890) (finding that public lands are “held in trust for all the *people*”) (emphasis added).

²³ See *Comer v. Murphy Oil USA*, 585 F.3d 855, 871 (5th Cir. 2009) (“The Court’s citation to *Marbury* in those cases, without explaining why Chief Justice Marshall’s theory was not strictly adhered to, caused confusion.”)

announced in *Marbury*.²⁴ However, the Court’s plain language in *Pacific States* explains that the defendant company had not contended “that there was anything inhering in the [challenged] tax or involved intrinsically in the law which violated any of its constitutional rights,” but rather, that the claims of infringement of individual rights were mere variations on its arguments under the Guarantee Clause.²⁵ “If such questions [of individual rights] had been raised,” the Court stated, “they would have been justiciable, and therefore would have *required* the calling into operation of judicial power.”²⁶ The Court further noted that the individual due process and equal protection rights had been asserted “not for the purpose of testing judicially some exercise of power assailed on the ground that its exertion has injuriously affected the rights of an individual because of repugnancy to some constitutional limitation, but to demand of the State that it establish its right to exist as a State, republican in form.”²⁷

Attempting to dispel the apparent confusion, the Court developed the modern encapsulation of the political question doctrine in the 1962 case of *Baker v. Carr*, in which Baker and other plaintiffs alleged that the Tennessee Secretary of State, Joe Carr, had violated their equal protection rights under the Fourteenth Amendment by failing to reapportion legislative districts in response to significant population migrations.²⁸ The *Baker* plaintiffs alleged that the malapportionment scheme had resulted in a “debasement of their votes” and accompanying

²⁴ 223 U.S. 118 (1912).

²⁵ *Id.* at 136-37, 150 (“The assignments of error filed on the allowance of the writ of error are numerous. The entire matters covered by each and all of them in the argument, however, are reduced to six propositions, which really amount to but one, since they are all based upon the single contention that the creation by a State of the power to legislate by the initiative and referendum causes the prior lawful state government to be bereft of its lawful character as the result of the provisions of § 4 of Art. IV of the Constitution”).

²⁶ *Id.* (emphasis added).

²⁷ *Id.* at 150-151.

²⁸ 369 U.S. 186 (1962).

diminishment of their voice in representational government.²⁹ The Court distinguished the plaintiffs' claims in *Baker* from those arising under the Guarantee Clause in *Luther* and its progeny, determining that the case was justiciable.³⁰ In doing so, the Court further distinguished the Due Process and Equal Protection claims deemed to constitute political questions in *Pacific States* as alleged "merely in verbal aid of issues which...entailed political questions," namely, resolution of a Guarantee Clause claim.³¹ The Court went on to distinguish *Pacific States* from cases in which individual rights claims had been properly asserted as distinct from Guarantee Clause claims in the same suits:

Pacific States may be compared with cases such as *Mountain Timber Co. v. Washington*, 243 U. S. 219 [(1917)], wherein the Court refused to consider whether a workmen's compensation act violated the Guaranty Clause but considered at length, and rejected, due process and equal protection arguments advanced against it, and *O'Neill v. Leamer*, 239 U.S. 244 [(1915)] wherein the Court refused to consider whether Nebraska's delegation of power to form drainage districts violated the Guaranty Clause, but went on to consider and reject the contention that the action against which an injunction was sought was not a taking for a public purpose.³²

Accordingly, *Baker* did not abandon *Marbury*'s delineation between political questions and claims implicating individual rights, but rather suggests that bona fide disputes claiming infringement of individual rights enshrined in the Constitution will not ordinarily present political questions.³³ "Consequently, the Court should be exceedingly reluctant to find an individual rights claim to be nonjusticiable, even though it may concern 'politics,' the political

²⁹ *Id.*

³⁰ *Id.* at 217-230.

³¹ *Id.* at 228.

³² *Id.*

³³ See, e.g., Jesse H. Choper, *The Political Question Doctrine: Suggested Criteria*, 54 DUKE L.J. 1457, 1468 (2005) ("Removing questions of individual rights from the judiciary's realm [is] something that would (and should) occur very infrequently."; "The necessity of vindicating constitutionally secured personal liberties is the principal justification for the awesome...power that judicial review confers upon the federal judiciary.")

process, or the internal workings of the political branches.”³⁴ A “question of constitutional construction concerning the most fundamental right[s]” does not implicate the political question doctrine.³⁵

In ruling that the *Baker* plaintiffs’ equal protection claims were justiciable, Justice Brennan articulated the modern test for whether a claim presents a nonjusticiable political question:

Prominent on the surface of any case held to present a political question is found [(1)] a textually demonstrable constitutional commitment of the issue to a coordinate political department; or [(2)] a lack of judicially discoverable and manageable standards for resolving it; or [(3)] the impossibility of deciding without an initial policy determination of a kind clearly for nonjudicial discretion; or [(4)] the impossibility of a court’s undertaking independent resolution without expressing lack of the respect due coordinate branches of government; or [(5)] an unusual need for unquestioning adherence to a political decision already made; or [(6)] the potential for embarrassment from multifarious pronouncements by various departments on one question.

Unless one of these formulations is *inextricable* from the case at bar, there should be no dismissal for nonjusticiability on the grounds of a political question’s presence.³⁶

Baker and subsequent precedent establish that the political question doctrine remains under this test an exception to the exercise of judicial jurisdiction that is of narrow applicability.

³⁴ *Id.* at 1469.

³⁵ *Kucini v. Forbes*, 432 F.Supp. 1101, 1109 (N.D. Ohio 1977) (“Further, this case does not revolve around a ‘political question’ as that term is used in *Baker v. Carr* but rather a question for which federal courts have been the final arbitrator throughout the existence of the United States; the interpretation of the United States Constitution. Here the court is asked to determine whether the plaintiff’s right to freedom of speech has been violated by the defendants. This is not a ‘political question’, but a question of constitutional construction concerning the most fundamental right enjoyed by Americans, the right to freedom of speech.”)(citations omitted); *see also Kurtz v. Baker*, 829 F.2d 1133, 1149 (D.C. Cir. 1987) (R. Ginsburg, J., concurring) (Even “Congress’ Rules and their implementation ‘may not . . . ignore constitutional restraints or violate fundamental rights,’ and on that score—and that score only—they are subject to judicial review.” (quoting *United States v. Ballin*, 144 U.S. 1, 5 (1892))).

³⁶ *Baker*, 369 U.S. at 217.

Determinations must be made by a searching inquiry on a case-by-case basis.³⁷ Indeed, in the over fifty years since *Baker*, the Supreme Court has dismissed only two cases as presenting nonjusticiable political questions.³⁸ As the Court noted in *Baker*, simply because a case implicates significant and entrenched political issues does not make it a case involving a “political question.”³⁹ The “courts cannot reject as ‘no law suit’ a bona fide controversy as to whether some action denominated ‘political’ exceeds constitutional authority.” “In general, the Judiciary has a responsibility to decide cases properly before it, even those it ‘would gladly avoid.’”⁴⁰ Courts adjudicate cases with significant political overtones on a regular basis. For example, the Supreme Court upheld a subpoena directed at the President of the United States⁴¹ and even adjudicated the legitimacy of a presidential election without so much as a mention of the political question doctrine.⁴² That Youth Plaintiffs’ claims, rooted in fundamental rights guaranteed by the Constitution, touch upon divisive political issues, is of no moment here: “[W]hen the rights of persons are violated, ‘the Constitution requires redress by the courts,’ notwithstanding the more general value of democratic decisionmaking.”⁴³ “Traditionally...it is established practice for [the] Court to sustain the jurisdiction of federal courts to issue injunctions to protect rights safeguarded by the Constitution”⁴⁴

³⁷ *Id.* at 211.

³⁸ See *Zivotofsky v. Clinton*, 132 S. Ct. 1421 (2012); *Nixon v. United States*, 506 U.S. 224 (1993).

³⁹ *Baker*, 369 U.S. at 217; see also *Kahawaiolaa v. Norton*, 386 F.3d 1271, 1277 (9th Cir. 2004) (quoting *INS v. Chadha*, 462 U.S. 919, 942-43 (1983)) (“[W]hile the controversy may be termed ‘political,’ the ‘presence of constitutional issues with significant political overtones does not automatically invoke the political question doctrine.’”).

⁴⁰ *Zivotofsky*, 132 S. Ct. at 1427 (citing *Cohens v. Virginia*, 19 U.S. (6 Wheat.) 264, 404 (1821) (the political question doctrine is “a narrow exception to that rule”).

⁴¹ *United States v. Nixon*, 418 U.S. 683 (1974).

⁴² *Bush v. Gore*, 531 U.S. 98 (2000).

⁴³ *Obergefell v. Hodges*, 135 S. Ct. 2584, 2605 (2015) (citing *Schuette v. BAMN*, 572 U.S. ___, slip op. at 17 (2014)).

⁴⁴ *Davis v. Passman*, 442 U.S. 228, 242 (1979) (internal citations omitted).

In fact, the very basis of the political question doctrine, rooted as it is in the separation of powers, establishes the justiciability of this case. In *Baker v. Carr*, Justice Brennan made clear that the political question doctrine is “essentially a function of separation of powers.”⁴⁵ A pronouncement of equal clarity from the Supreme Court came in *Bowsher v. Synar*, in which the Court stated that “the declared purpose of separating and dividing the powers of government, of course, was to diffuse power the better to secure liberty.”⁴⁶ As a check on the legislative and executive branches, “[i]t is emphatically the province and duty of the judicial department to say what the law is”⁴⁷ in the course of “policing the enduring structure of constitutional government when the political branches fail to do so.”⁴⁸ Where the other branches have infringed upon the rights of individuals, the exercise of this duty does not present a “‘political question’, but a question of constitutional construction concerning the most fundamental right[s] enjoyed by Americans....”⁴⁹

That the Court seized upon the factual circumstances of *Baker* to announce the modern test for determining the presence of a political question, and found the plaintiffs’ equal protection claims in that case justiciable, is illustrative of the importance and justiciability of Youth Plaintiffs’ claims here. The *Baker* plaintiffs’ equal protection claims, like those in other malapportionment cases⁵⁰, were rooted in a “debasement of their votes” and an accompanying

⁴⁵ 369 U.S. at 217.

⁴⁶ 478 U.S. at 721.

⁴⁷ *Marbury*, 5 U.S. (1 Cranch) at 177.

⁴⁸ *Nat’l Labor Relations Board v. Canning*, 134 S. Ct. at 2593 (Scalia, A., concurring).

⁴⁹ *Kucini*, 432 F.Supp. at 1109; *see also* Torres & Bellinger, note 20, *supra*, at 297-300 (The political question doctrine does not apply to public trust claims because, among other reasons, the determination of public trust rights “is nothing more than the vindication of a constitutional right,” and “[w]here courts examine doctrines that exist to serve later generations, the political question doctrine simply does not apply in the same way it would in other contexts.”) (citations omitted).

⁵⁰ *See, e.g., Reynolds*, 377 U.S. 533.

diminishment of their voice in representational government.⁵¹ Cases touching upon equal protection principles with respect to voting rights are particularly suitable for judicial review as the right to vote is “a fundamental political right, because [it is] preservative of all rights.”⁵² As Youth Plaintiff’s have aptly noted: “The underlying constitutional violation in malapportionment cases shares a commonality with Plaintiffs’ claims here: both involve harms that are significantly difficult to redress through the normal political process, and both present questions of fundamental preservative rights, essential in a free and democratic society.”⁵³ Plaintiffs in voting rights cases must rely on the courts for redress because, by the nature of their claims, they cannot effectively preserve their fundamental rights through the political process. Youth Plaintiffs share that characteristic. Youth Plaintiffs, whose fundamental rights arising under the Fifth, Ninth, and Fourteenth (as applicable to the Federal Government through the Due Process Clause of the Fifth) Amendments, and the public trust doctrine, have been and are being infringed by the Federal Defendants’ historical and continuing creation and exacerbation of a dangerous climate system, cannot rely on the normal representational political process to safeguard their fundamental rights; their only redress is through the judiciary.⁵⁴ If this Court declines to exercise its constitutional mandate to assert jurisdiction over Youth Plaintiffs’ claims and “preserve the right of every individual to claim the protection of the laws, whenever he receives an injury,”⁵⁵ Youth Plaintiffs will have lost the constitutionally protected right to preserve their liberties since,

⁵¹ 369 U.S. at 186.

⁵² *Yick Wo v. Hopkins*, 118 U.S. 356, 370 (1886).

⁵³ Plaintiffs’ Memorandum in Opposition to Defendant Intervenors’ Motion to Dismiss, Dkt. 56, 27.

⁵⁴ Jesse H. Choper, note 33 *supra*, at 1468-69 (“This distinction” between fundamental individual rights and claims presenting political questions “exists because, where personal rights of underrepresented interests are at stake, it cannot often be assumed that the majoritarian political process can produce a trustworthy result.”)

⁵⁵ *Marbury*, 5 U.S. (1 Cranch) at 163.

by the time they are able to participate in the political process to preserve their rights, the stable climate system on which their rights depend will have already sustained irreparable damage. Indeed, those rights have already been violated by the dangerous climactic conditions created and exacerbated by the Federal Defendants. Youth Plaintiffs' claims, like those of plaintiffs in malapportionment cases, do not implicate the political question doctrine. Rather, the very nature of the fundamental constitutional rights at issue in this case, by the separation of powers principles underlying the political question doctrine, calls upon this Court to fulfill its constitutional duty to serve as a check and balance to the other branches and safeguard the rights of Youth Plaintiffs.

B. This Case Does Not Implicate A Political Question Under the *Baker* Factors

Under *Baker v. Carr*, unless one of the following considerations is “*inextricable* from the case at bar, there should be no dismissal for non-justiciability on the ground of a political question's presence”: (1) a “textually demonstrable constitutional commitment of the issue to a coordinate political department”; (2) “lack of judicially discoverable and manageable standards for resolving it”; (3) “the impossibility of deciding without an initial policy determination of a kind clearly for nonjudicial discretion”; (4) “the impossibility of a court’s undertaking independent resolution without expressing the lack of respect due coordinate branches of government”; (5) “an unusual need for unquestioning adherence to a political decision already made”; or (6) the potential of embarrassment from multifarious pronouncements by various departments on one question.”⁵⁶ As explained below, these concerns are not present in Youth Plaintiffs’ case.⁵⁷

⁵⁶ *Baker*, 369 U.S. at 217 (emphasis added).

⁵⁷ The Federal Defendants have not argued that Youth Plaintiffs’ claims implicate a political question. Intervenor-Defendants’ political question arguments focus on formulations 1, 2, and 4

1. The First *Baker* Formulation

Under the first *Baker* formulation, a court should dismiss a claim as presenting a nonjusticiable political question if there has been “a textually demonstrable constitutional commitment of the issue to a coordinate political department.”⁵⁸ This is the *Baker* formulation that, if present, counsels most strongly in favor of nonjusticiability: “Although the Supreme Court has identified these six separate contexts in which the political question doctrine applies, ‘[b]ecause the nonjusticiability of political questions is primarily a function of the constitutional separation of powers the dominant consideration in any political question inquiry is whether there is a textually demonstrable constitutional commitment of the issue to a coordinate political department.’”⁵⁹

The Intervenor-Defendants have argued that the first *Baker* formulation is implicated here because: “The Constitution by its terms commits legislative power—in particular, authority “To regulate Commerce”—to Congress, U.S. Const. art. I, §§ 1, 8, and executive power to the President, *see* U.S. Const. art. II, § 1.”⁶⁰ However, neither of these Constitutional provisions vests unchecked authority over these fields to Congress or the President, respectively, such that they may exercise their authority in a manner that infringes upon individuals’ constitutional rights.⁶¹ “[A] federal court may decide a matter that merely implicates a matter within the authority of a political branch. For example, Congress alone has the authority to pass legislation,

(*See* note 8, *supra*) and accordingly, *amici* focus their analysis on those factors

⁵⁸ *Baker*, 369 U.S. at 217.

⁵⁹ *Republic of Colombia v. Diageo North America Inc.*, 531 F.Supp. 2d 365, 417 (E.D.N.Y. 2007) (quoting *767 Third Avenue Assocs. v. Consulate Gen., of Socialist Fed. Rep. of Yugoslavia*, 218 F.3d 152, 160 (2d Cir.2000)).

⁶⁰ Int. MTD at 12.

⁶¹ *See, e.g., Murphy Oil USA*, 585 F.3d at 874 (“[F]ederal courts may not decide an issue whose resolution is committed by the Constitution to the *exclusive* authority of a political branch of government...” (citations omitted)).

but the courts have authority to assess the constitutionality of a statute that has been properly challenged.”⁶² Indeed, it is clear that “the Commerce Clause is not a political question wholly committed to congressional discretion....”⁶³ Stated otherwise: “[T]he assignment of power to Congress to regulate interstate commerce or to provide for the general welfare, may be exercised only within the constraints of other constitutional provisions.”⁶⁴ This principle is equally applicable to the President and agencies within the executive branch.⁶⁵

The Intervenor-Defendants claim that the relief requested by Youth Plaintiffs requires the court to impermissibly engage in activities in which a textually demonstrable constitutional commitment has been made to other branches because “[t]he complaint asks this Court to direct agencies of the Executive Branch—as well as the President—to promulgate specific regulations to achieve a particular goal.”⁶⁶ However, nothing in Youth Plaintiffs’ prayer for relief requests of or requires this Court to issue such a ruling requiring “specific regulations”; it merely asks this Court to issue declaratory and injunctive relief appropriate to remedy the infringement of Youth Plaintiffs’ fundamental rights alleged. The particular methods, intricacies, and responsibilities for remedying such infringements can be properly left to Federal Defendants to develop and implement, subject to this Court’s oversight and approval to ensure that the proposed remedy provides adequate redress under the legal theories claimed. Additionally, to the extent that this Court finds that the discrete affirmative actions of Federal Defendants have violated Youth

⁶² *Id.*

⁶³ *United States v. Hickman*, 179 F.3d 230 (5th Cir. 1999) (en banc) (no pin cite available)

⁶⁴ *Nixon v. United States*, 938 F.2d 239, 256 (D.C. Cir. 1991), *aff’d* 506 U.S. 224 (1993).

⁶⁵ *See Elrod v. Burns*, 427 U.S. 347, 352 (1976) (“[T]here can be no impairment of executive power,” implicating separation of powers concerns and the political question doctrine “whether at the state or federal level, where actions pursuant to that power are impermissible under the Constitution.”).

⁶⁶ Reply In Support of Intervenor-Defendants’ Motion to Dismiss, Dkt. 59, 12; Intervenor-Defendants’ Objections to Magistrate’s Findings and Recommendation, Dkt. 73, 22 (Int. Objections).

Plaintiffs’ rights, it is within this Court’s power to enjoin such actions. Moreover, the Intervenor-Defendants’ contention that this Court is without authority to order an agency to engage in rulemaking is incorrect. Though it is not the province of this Court to mandate the exact specificity of such regulations, as Magistrate Coffin notes, “courts can order agencies” delegated authority “to craft regulations” by Congress “to engage in such process” and to order them to “address constitutional violations by government agencies and provide equitable relief.”⁶⁷ Resolution of Youth Plaintiffs’ claims does not require this Court to engage in activities committed to coordinate branches and it should not be dismissed on that basis. The principle of separation of powers mandates that the judiciary exercise its duty and authority under Article III to serve as a check and balance to Congress’ legislative and the President’s and agencies’ executive powers where they are exercised to infringe the rights of individuals. As the Supreme Court recently stated, “the Constitution contemplates that democracy is the appropriate process for change, so long as that process does not abridge fundamental rights.”⁶⁸ “Thus, when the rights of persons are violated, the Constitution requires redress by the Courts, notwithstanding the more general value of democratic decisionmaking.”⁶⁹

2. The Second *Baker* Formulation

Under the second *Baker* formulation, a case presents a political question if there exists a “lack of judicially discoverable and manageable standards for resolving it.”⁷⁰ Under the law of the Ninth Circuit, “the crux of this inquiry is...not whether the case is unmanageable in the sense of being large, complicated, or otherwise difficult to tackle from a logistical standpoint,” but rather whether “a legal framework exists by which courts can evaluate...claims in a reasoned

⁶⁷ Order & Findings at 13.

⁶⁸ *Obergefell v. Hodges*, 135 S. Ct. at 2605 (citation and quotations omitted).

⁶⁹ *Id.*

⁷⁰ *Baker*, 369 U.S. at 217.

manner.”⁷¹ The Intervenor-Defendants assert that a lack of discoverable and manageable standards is present because this Court would need “to resolve the scientific likelihood of the various risks of climate change, and their likely impact on the Nation.”⁷² However, courts engage in deciding complex scientific issues regularly and have readily available standards for resolving them through the use and aid of expert witnesses with scientific expertise in various disciplines. The *Daubert* standard of qualification of expert witnesses serves as a ready and manageable standard to this effect.⁷³ Courts may also employ the aid of scientific special masters. As Justice Breyer has acknowledged:

The Supreme Court has...decided basic questions of human liberty, the resolution of which demanded an understanding of scientific matters....Scientific issues permeate the law.... Courts review the reasonableness of administrative agency conclusions about the safety of a drug, the risks attending nuclear waste disposal, the leakage potential of a toxic waste dump, or the risks to wildlife associated with the building of a dam. Patent law cases can turn almost entirely on an understanding of the underlying technical or scientific subject matter. And, of course, tort law often requires difficult determinations about the risk of death or injury associated with exposure to a chemical ingredient of a pesticide or other product.... [W]e must search for law that reflects an understanding of the relevant underlying science, not for law that frees [defendants] to cause serious harm.⁷⁴

That climate change poses complex scientific issues does not make this case one in which manageable standards are unavailable. Like other cases involving complex science, scientific experts are available to aid the court in its determinations.

Intervenor-Defendants also claim that this Court lacks “judicially discoverable and manageable standards” to decide this case, because, as they claim, in order to do so, this Court must “weigh the risks [of climate change] against the possible benefits of emissions-producing

⁷¹ *Alperin v. Vatican Bank*, 410 F.3d 532, 552, 55 (9th Cir. 2005).

⁷² Int. Objections at 24.

⁷³ *Daubert v. Merrill Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

⁷⁴ Breyer, Stephen, J., “Science in the Courtroom,” *Issues in Science and Technology* 16, no. 4 (Summer 2000).

activities (in the past and future) and associated reduction measures and then make a comparative judgment to determine which industries, sectors, and nations should have been required, and should now be required, to reduce their emissions and by how much.”⁷⁵ However, this Court has judicially discoverable and manageable standards readily at its disposal to decide Youth Plaintiffs’ substantive due process and public trust claims and the standards applicable to those claims do not require this Court to “weigh the risks” of climate change against any purported benefits of “emissions-producing activities.” The test applicable to due process claims in which, after placing a claimant in a position of danger, or enhancing such danger, government actions or omissions deprive a claimant of life, liberty, or property, is whether the government has acted with “deliberate indifference.”⁷⁶ Courts do not engage in a balancing of interests where circumstances constituting deliberate indifference on the part of government actors have deprived a claimant of due process rights.⁷⁷ Similarly, violations of the public trust doctrine are analyzed according to whether the alleged violation has caused a “substantial impairment” to trust resources and the interests of trust beneficiaries in such resources.⁷⁸ Likewise, in deciding whether government action has effected a “substantial impairment” of trust resources or interests, courts do not balance the interests of trust beneficiaries in such resources against the alleged justifications for such impairment.⁷⁹

Likewise, judicially manageable standards are readily available to decide Youth Plaintiffs’ equal protection claims, namely the strict scrutiny test applied in claims in which government action is based on a suspect classification or infringes the fundamental rights of a

⁷⁵ Int. Objections at 24.

⁷⁶ *Penilla v. City of Huntington Park*, 115 F.3d 707, 709 (9th Cir. 1997); *Wood v. Ostrander*, 879 F.2d 583 (9th Cir. 1989).

⁷⁷ *Penilla*, 115 F.3d 707; *Wood*, 879 F.2d 583.

⁷⁸ *Ill. Central*, 146 U.S. at 435, 452, 453.

⁷⁹ *Id.*

particular class.⁸⁰ Strict scrutiny requires courts to determine whether the challenged governmental activity is “narrowly tailored to serve a compelling governmental interest.”⁸¹ In applying this test, courts are certainly called to take into account the interests asserted by the government in justification of its actions, such as, here, the interest in “the possible benefits of emissions-producing activities”⁸² but should conduct a searching inquiry into the factual justifications for their alleged effectiveness⁸³, mindful of such considerations as, here, the economic costs of climate change and the economic benefits and potential for job creation made possible by a transition to an economy focused on clean and sustainable sources of energy. As the *Baker* Court stated, “[j]udicial standards under the Equal Protection Clause are well developed and familiar.” This Court has judicially discoverable and manageable standards at its disposal to adjudicate all of Youth Plaintiff’s claims. Accordingly, dismissal under the political question doctrine would not be appropriate. This Court cannot avoid its responsibility “to decide on the rights of individuals”⁸⁴ merely “because the issues have political implications.”⁸⁵

3. The Fourth *Baker* Factor

Under the fourth *Baker* formulation, a case presents a nonjusticiable political question if there exists “the *impossibility* of a court’s undertaking independent resolution without expressing

⁸⁰ *Maier v. Roe*, 432 U.S. 464, 470 (1977) (“The basic framework for analysis of [an equal protection claim] is well settled” and requires the court to use “strict judicial scrutiny” in evaluating the constitutionality of government activity “which operates to the disadvantage of some suspect class or impinges upon a fundamental right explicitly or implicitly protected by the Constitution.”) (internal quotations and citations omitted).

⁸¹ *Whitman v. Personhuballah*, 578 U.S. ___, slip op. at 4 (2016).

⁸² Int. Objections at 24.

⁸³ *United States v. Virginia*, 518 U.S. 515, 516 (1996) (“The justification must be genuine, not hypothesized or invented *post hoc* in response to litigation.”) (gender discrimination case applying intermediate scrutiny).

⁸⁴ *Marbury*, 5 U.S. (1 Cranch) at 170.

⁸⁵ *INS v. Chadha*, 46 U.S. at 943.

the lack of respect due coordinate branches of government.”⁸⁶ That concern is not present in this case, which seeks only for this Court to exercise its duty to protect the fundamental rights of individuals. As the Supreme Court recently stated, “[t]he identification and protection of fundamental rights is an enduring part of the judicial duty to interpret the Constitution.”⁸⁷ Consistent with this duty, where the fundamental rights of individuals are implicated, concerns regarding separation of powers counsel in favor of justifiability because “[t]he declared purpose of separating and dividing the powers of government, of course, was to diffuse power the better to secure liberty.”⁸⁸

Even in absence of the consideration that the principle of separation of powers favors the justiciability of this case, the resolution of this case does not implicate a lack of respect for other branches. The Intervenor-Defendants claim that such lack of respect is involved in this case because “Congress and executive agencies have taken a wide range of steps to assess and address the potential impacts and risks of climate change.”⁸⁹ However, that Defendants have taken steps to address climate change does not absolve them of their duty to abide by the requirements of the Constitution to refrain from infringing the fundamental rights of individuals⁹⁰, nor this Court of its duty to enforce the Constitution and protect the rights of such individuals.⁹¹ “Since the

⁸⁶ *Baker*, 363 U.S. at 217 (emphasis added).

⁸⁷ *Obergefell*, 135 S. Ct. at 2605.

⁸⁸ *Bowsher*, 478 U.S. at 721 (1986).

⁸⁹ Int. Objections at 24.

⁹⁰ *In re Agent Orange Product Liability Litig.*, 373 F.Supp.2d 7, 72 (E.D.N.Y. 2005) (“The determination that a branch of government has exceeded its constitutional authority does not express lack of respect for it.”)

⁹¹ *Kucini*, 432 F.Supp. at 1109 (“Further, this case does not revolve around a ‘political question’ as that term is used in *Baker v. Carr* but rather a question for which federal courts have been the final arbitrator throughout the existence of the United States; the interpretation of the United States Constitution. Here the court is asked to determine whether the plaintiff’s right to freedom of speech has been violated by the defendants. This is not a “political question”, but a question of constitutional construction concerning the most fundamental right enjoyed by Americans, the

separation of powers exists for the protection of individual liberty, its vitality ‘does not depend’ on ‘whether the encroached-upon branch approves the encroachment.’”⁹² Quite the contrary: “policing the enduring structure of constitutional government when the political branches fail to do so is one of the most vital functions of this Court.”⁹³ Moreover, the fourth *Baker* formulation is “*only* implicated where judicial resolution of a question would contradict prior decisions taken by a political branch in those limited contexts where such contradiction would *seriously* interfere with important governmental interests.”⁹⁴ Here, Youth Plaintiffs’ case would not cause such serious interference because they seek only an order declaring that Defendants have violated their constitutional and public trust rights and a remedy, prepared by Defendants, satisfactory to rectify those violations. Youth Plaintiffs do not request that this Court substitute its judgment for that of the legislative and executive branches by invalidating any statutes or regulations enacted by Defendants to address climate change. Rather they request that this Court enjoin defendants from further violation of their rights and direct Defendants to prepare a plan, of their own devising, adequate to protect Youth Plaintiffs from further injury. Since such a plan would of necessity consist of, in Intervenor-Defendants’ words, “steps to assess and address the...impacts and risks of climate change,”⁹⁵ in order to avert dangers acknowledged by Defendants⁹⁶, such

right to freedom of speech.”)

⁹² *NLRB v. Canning*, 134 S. Ct. at 2593 (2014) (Scalia, A., concurring) (citations omitted).

⁹³ *Id.*

⁹⁴ *In re Methyl Tertiary Butyl Ether Prods. Liab. Litig.*, 438 F. Supp. 2d 291, 298 (S.D.N.Y. 2006) (emphasis added) (internal quotations and citations omitted).

⁹⁵ Int. Objections at 24.

⁹⁶ Federal Defendants’ Objections to Findings and Recommendations of Magistrate Judge, Dkt. No 74, 1 (“Climate change poses a monumental threat to Americans’ health and welfare by driving long-lasting changes in our climate, leading to an array of severe negative effects, which will worsen over time.”) (citing Endangerment & Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496, 66,518 (Dec. 15, 2009) (concluding that “compelling” scientific evidence supports the “attribution of observed climate change to anthropogenic” emissions of greenhouse gases)).

relief would not implicate a lack of respect. It would be a convoluted application of principle to hold that the very actions taken by the Federal Defendants which have proven inadequate to address and curtail their infringement of Youth Plaintiffs' fundamental rights effectively block these young plaintiffs from the doors of our nation's courthouses. Because Youth Plaintiffs' claims implicate none of the *Baker* factors cited by Intervenor-Defendants, the political question does not apply. On the contrary, the very foundation of the political question doctrine – the principle of separation of powers – calls upon this Court to exercise its constitutional duty to serve as a check and balance to the other branches where they have infringed Youth Plaintiffs' fundamental rights. This Court should not decline to exercise its constitutional duty to hear this case.

C. The Best Available Climate Science Counsels In Favor of Justiciability

The latest and best available climate science illustrates the urgent need for judicial intervention to protect Youth Plaintiffs, future generations, and their fundamental rights from the dangers of catastrophic climate change. As explained by Dr. James Hansen⁹⁷, former Director of the NASA Goddard Institute for Space Studies and current Adjunct Professor at Columbia University's Earth Institute, where he directs the University's Climate Science Program, immediate "[a]ction is required to preserve and restore the climate system such as we have

⁹⁷ Dr. Hansen trained in physics and astronomy in the space program at the University of Iowa where he received a bachelor's degree with highest distinction in mathematics and physics, a master's degree in astronomy, and a Ph.D. in physics in 1967. Dr. Hansen has focused on studies and computer simulations of the Earth's climate since the mid-1970's for the purpose of studying the human impact on climate change. Dr. Hansen is an elected member of the United States National Academy of Sciences (1995), a recipient of the Heinz Award for the Environment (2001), the Leo Szilard for use of Physics for the Benefit of Society (2007), the American Association for the Advancement of Science Award for Scientific Freedom and Responsibility (2007), the Sophie Prize (2010), and the Blue Planet Prize (2010). He has testified before the United States Senate and House of Representatives on numerous occasions regarding climate change.

known it in order for the planet as we have known it to continue to adequately support the lives and prospects of young people and future generations.”⁹⁸

Dr. Hansen’s data and research shows that, as a result of fossil fuel emissions, Earth has already warmed approximately 1°C above the preindustrial level, which is “close to, and probably slightly above, the prior maximum of the Holocene Era, the period of relatively stable climate over the past 10,000 years that has enabled human civilization to develop.”⁹⁹

Additionally, atmospheric concentration of CO₂ “now exceeds 400 ppm, over 40 percent more than the pre-industrial level.”¹⁰⁰ The 1°C warming attributable to anthropogenic climate change that has already occurred since the pre-industrial era has already begun to have a wide-spread effect on human and natural systems, including significant glacial retreat, heavier and more extreme flooding, intensification of droughts, expansion of subtropical climates, significant annual losses of coral reef areas, increasingly frequent temperature anomalies, wildfires of increased frequency and intensity, increases in dangerous heat waves, loss of agriculturally suitable land, proliferation of disease vectors, heat stroke and respiratory illnesses and complications, availability of fresh water, and loss of species diversity, to name a few effects.¹⁰¹ The likelihood and severity of these impacts and occurrences are projected to increase if fossil fuel emissions are not rapidly reduced.¹⁰²

In order to avoid dangerous climate tipping points and self-reinforcing feedback loops, Dr. Hansen concludes that “global atmospheric CO₂ concentrations must be reduced to 350 ppm

⁹⁸ Declaration of Dr. James E. Hansen in Support of Our Children’s Trust et al.’s Submission to the U.N. Committee on the Rights of the Child Regarding States Obligations, Children’s Rights, and Climate Change, ¶ 91 (attached hereto as **Exhibit A**) (hereinafter “Hansen Declaration”).

⁹⁹ *Id.* at ¶ 29.

¹⁰⁰ *Id.* at ¶ 20.

¹⁰¹ *Id.* at ¶¶ 47-62.

¹⁰² *Id.* at ¶¶ 47-62.

and long-term average global temperature increase above preindustrial levels must be limited to 1°C in order to preserve a habitable planet for future generations, preserve the climate system, and avert irretrievable damage to human and natural systems – including agriculture, ocean fisheries, and fresh water supply – on which human civilization depends.”¹⁰³ In order to achieve this goal, global emissions must be reduced by 7% annually if commenced in 2016, 8% annually if commenced in 2017, and 8.5% annually if commenced in 2018.¹⁰⁴ By contrast, if appropriate annual emissions reductions had commenced in 2005, only a 3.5% reduction in emissions per year would have been necessary.¹⁰⁵ If rapid annual reductions of emissions are not commenced until 2030, the global average temperature would remain above 1°C for approximately 400 years, and if not commenced until 2040, atmospheric concentrations of CO₂ would not fall below 350 pm for nearly 1,000 years.¹⁰⁶

Dr. Hansen’s research establishes that the climate crisis is one of urgency that must be addressed on a timely basis in order to preserve a habitable planet for youth and future generations. The “present level of CO₂ and its warming, both realized and latent, is already in the dangerous zone. Indeed, we are now in a period of overshoot, with early consequences that are already highly threatening and that will rise to unbearable unless action is taken to restore energy balance at a lower CO₂ amount.”¹⁰⁷ Despite these dangers, Dr. Hansen’s data illustrates that both the growth rate of annual fossil fuel emissions and global atmospheric concentrations of CO₂ continue to rise at an alarming rate.¹⁰⁸

“If fossil fuel emissions are not systematically and rapidly abated...then youth and future

¹⁰³ *Id.* at ¶ 64, 69.

¹⁰⁴ *Id.* at ¶ 68.

¹⁰⁵ *Id.* at ¶ 70.

¹⁰⁶ *Id.* at ¶ 69.

¹⁰⁷ *Id.* at ¶ 36.

¹⁰⁸ *Id.* at ¶¶ 19-21.

generations will confront what reasonably can only be described as, at best, an inhospitable future. That future may be marked by rising seas, coastal city functionality loss, mass migrations, resource wars, food shortages, heat waves, mega-storms, soil depletion and desiccation, freshwater shortage, public health system collapse, and the extinction of increasing numbers of species. That is to mention only the start of it.”¹⁰⁹

As demonstrated by Dr. Hansen’s research, the fundamental rights of Youth Plaintiffs and future generations depend on swift action and resolution of the climate crisis. Despite having known of the dangers of this crisis for over fifty years, the legislative and executive branches have failed to take meaningful action to address it and in fact have engaged in affirmative acts that have created and exacerbated the dangerous climate situation that now looms over posterity. As Magistrate Coffin acknowledged in his Order and Findings & Recommendation:

The debate about climate change and its impact has been before various political bodies for sometime now. Plaintiffs give this debate justiciability by asserting harms that befall or will befall them personally and to a greater extent than older segments of society. It may be that eventually the alleged harms, assuming the correctness of plaintiffs’ analysis of the impacts of global climate change, will befall all of us. But the intractability of the debates before Congress and state legislatures and the alleged valuing of short term economic interest despite the cost to human life, necessitates a need for the courts to evaluate the constitutional parameters of the action or inaction taken by the government. This is especially true when such harms have an alleged disparate impact on a discrete class of society.¹¹⁰

Magistrate Coffin’s analysis touches appropriately upon the principle that, where the representative branches of government have failed to protect the preservative rights of individuals underrepresented in the political process, it is the province and duty of the courts to adjudicate those rights, and protect those dependant on them. Like the plaintiffs in

¹⁰⁹ *Id.* at ¶ 90.

¹¹⁰ Order & Findings at 8.

malapportionment cases, such as *Baker v. Carr*¹¹¹, who depended on the judiciary to protect their legal rights in the political process, Youth Plaintiffs and future generations cannot now protect their rights through the political branches. Just as voting rights are “preservative of all rights,”¹¹² so too are Youth Plaintiffs’ and posterity’s fundamental individual rights dependant on the existence of a stable climate system for support. None of the claims in this case presents a political question; this Court should exercise its jurisdiction to protect Youth Plaintiffs’ constitutional and public trust rights where the legislative and executive branches have failed despites ample opportunities to act over at least five decades.

CONCLUSION

The political question doctrine does not present a bar to justiciability in this case. Youth Plaintiffs have alleged infringement of their fundamental individual rights under the Fifth, Ninth, and Fourteenth (as applicable to the federal government through the Due Process Clause of the Fifth) Amendments and the public trust doctrine. None of the *Baker* formulations are implicated by these claims. On the contrary, the separation of powers principles underlying the political question doctrine counsel in favor of justiciability. It is therefore the proper constitutional role for the judiciary to exercise its jurisdiction over Youth Plaintiffs’ claims and given the urgency of the climate crisis, this Court may be Youth Plaintiffs’ last chance to protect their rights.

Respectfully submitted this 12th day of September, 2016.

/s/ Travis Eiva
Travis Eiva (OR Bar 052440)
Zemper Eiva Law LLC
101 East Broadway, Suite 303

¹¹¹ 369 U.S. 186.

¹¹² *Yick Wo*, 118 U.S. at 370.

Eugene, OR 97401
travis@zempereiva.com
Tel: 541-636-7480

/s/ Erin J. Zemper
Erin J. Zemper (OR Bar 044628)
Zemper Eiva Law LL
101 East Broadway, Suite 303
Eugene, OR 97401
erin@zempereiva.com
Tel: 541-636-7480

Attorneys for Amici Curiae
League of Women Voters of the United States and
League of Women Voters of Oregon

On the Brief:

Andrew L. Welle (OR Bar 154466)
Law Office of Andrew Welle
3510 N. Kerby Ave
Portland, OR 97227
andrew.welle@gmail.com
Tel: 574-315-5565

Attorney for Amici Curiae
League of Women Voters of the United States and
League of Women Voters of Oregon

CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that this brief complies with the applicable word-count limitation under LR 7-2(b) because it contains less than 35 pages and less than 11,000 words, including headings, footnotes, and quotations, but excluding the caption, table of contents, table of cases and authorities, signature block, exhibits, and any certificates of counsel.

/s/ Travis Eiva
Travis Eiva (OR Bar 052440)
Zemper Eiva Law LLC
101 East Broadway, Suite 303
Eugene, OR 97401
travis@zempereiva.com
Tel: 541-636-7480

*Of Attorneys for Amici Curiae
League of Women Voters of the United States and
League of Women Voters of Oregon*

Exhibit A

**Declaration of Dr. James E. Hansen in Support of
Our Children's Trust et al.'s Submission to the
UN Committee on the Rights of the Child Regarding
State Obligations, Children's Rights and Climate Change**

I, DR. JAMES E. HANSEN, hereby declare as follows:

1. I make and offer this declaration as an expert in the field of climate science.
2. I am a U.S. citizen, an Adjunct Professor at Columbia University's Earth Institute, and Director of the Climate Science, Awareness and Solutions program at the Earth Institute, Columbia University. I am also the immediate past Director of the NASA Goddard Institute for Space Studies and a member of the United States National Academy of Sciences.

I have testified before the United States Senate and House of Representatives on many occasions, and in court on several occasions, in support of efforts to reduce reliance on carbon-intensive energy from fossil fuels and rapidly transition to carbon-free energy.

3. My training is in physics and astronomy, with early research on the clouds of Venus. Since the late 1970s, I have focused my research on Earth's climate, especially human-made climate change. Most recently, I have dedicated significant effort towards outlining the actions that must be undertaken by communities, governments around the world, the international community, and others, in order to preserve a viable climate system for young people, future generations, and other life on Earth. For the Committee's more complete reference, I have attached my full CV as Exhibit 1 to this declaration.

4. In my opinion, the necessity of a clear scientifically-supported standard for governments to follow in order to halt climate change and protect the fundamental human rights of current and future generations of children is made necessary by the at-best schizophrenic, if not suicidal, nature of global climate and energy policy.

5. On the one hand, many governments around the world have recognized a fundamental duty to protect the public resources of their own nations; to safeguard lives, liberty, and property;

to ensure equal protection under the law for both present and future generations; and, pursuant to the United Nations Framework Convention on Climate Change (UNFCCC), to “protect the climate system for present and future generations.”

6. On the other hand, these same governments continue to permit and otherwise support industry’s efforts to exploit fully our reserves of gas, coal, and oil, even in the face of increasingly overwhelming evidence that our continued fossil fuel dependency is driving the atmospheric concentration of carbon dioxide (CO₂) far beyond that in human experience, and constitutes one of the greatest threats to human civilization and nature alike.

7. These antinomies cannot be explained away as the product of ignorance. Governments have known for decades that the continued burning of coal, oil and natural gas, compounded by global deforestation and other land use change, causes global warming and risks dangerous and uncontrollable destabilization of the planet’s climate system, on which young people and future generations depend.

8. Moreover, governments across the globe have, during this last half decade, promoted the exploitation and consumption of fossil fuels in myriad ways. They include: permitting of fossil fuel development projects; financing of extra-territorial fossil fuel development projects through the Export Import Bank and World Bank; issuance of leases and permits for oil, gas and coal extraction and development within their own borders; and subsidies through tax credits, deductions, preferences, percentage depletion, expensing, favorable loans and guarantees, accelerated amortization, below fair-market-value lease and royalty requirements, and other favorable tax treatment for fossil fuel development. This listing is partial.

9. It is now clear, as the relevant scientific community has established for some time, that continued high CO₂ emissions from fossil fuel burning will further disrupt Earth's climate system, and that, in turn, will impose profound and mounting risks of ecological, economic and social collapse. In my view, the actions and inactions of the world's governments that cause or contribute to those emissions violate the fundamental human rights of children and future generations. Those violated rights include the rights to life, survival and development guaranteed by Article Six of the Convention on the Rights of the Child, as well as the rights to the attainment of the highest standard of health and an adequate standard of living guaranteed by Articles 24 and 27. These and other fundamental rights of children will be honored only in their breach should nations and the international community fail to preserve and restore a habitable climate system.¹

10. Here, then, I will address the fundamental context in which those fundamental rights violations arise. That context includes Earth's present and growing energy imbalance and the still real, but highly time-limited, opportunity to rapidly phase-down CO₂ emissions, restore energy balance, and stabilize the climate system.

11. More detailed treatment of these points, with supporting explanatory material and data, can be found in two recent papers of which I am the lead author.

12. The first, Assessing “Dangerous Climate Change”: Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature, was published in late 2013, in conjunction with 17 colleagues.² In that study we established that continued fossil fuel burning

¹ These and other fundamental rights – all of which are at least implicit in other Articles in the Convention — include the right to liberty, the right to property, the right to equal protection under the law, the right to government protection of public trust resources

² [I hereby incorporate into this declaration the analyses and conclusions of:](#) James Hansen et al., (2013) *Assessing “Dangerous Climate Change”: Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature*, PLOS ONE 8, e81648, available at

up to even 2°C above the preindustrial level³ likely would cause large climate change with disastrous and irreversible consequences. Accordingly, actions to rapidly phase out CO₂ emissions and draw down excess atmospheric carbon are urgently needed to reduce the atmospheric CO₂ concentration to no more than 350 ppm, allowing temperature to decline this century to a level less than 1°C above preindustrial temperatures.

13. The second, Ice Melt, Sea Level Rise and Superstorms: Evidence from Paleoclimate Data, Climate Modeling, and Modern Observations that 2°C Global Warming Could be Dangerous, was published in March 2016.⁴ In it we conclude that, if CO₂ emissions are allowed such that energy is continuously pumped at a high rate into the ocean, then multi-meter sea level rise will become practically unavoidable, with consequences that may threaten the very fabric of civilization.

I. PRESENT AND LOOMING CLIMATE CRISES, AND A PATH TO STABILITY

14. As indicated above, our late-2013 study provides a detailed treatment of our present predicament and the route that must be taken to sufficiently reduce atmospheric CO₂ to preserve a habitable climate system.⁵ Our most recent work – establishing that nonlinear melting of Earth's major ice sheets is likely within a century, among other things, if fossil fuel emissions continue

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0081648> [hereinafter *Dangerous Climate Change*].

³ In just this past year global temperature passed the 1°C level above preindustrial temperature. However, this current high temperature is partly a temporary effect of a strong El Nino, a natural oscillation of tropical Pacific Ocean temperature. Global temperature will decline to a level below 1°C on a long-term basis if CO₂ is reduced to 350 ppm.

⁴ I hereby incorporate by reference into this declaration the analyses and conclusions of: James Hansen et al., (2016), *Ice Melt, Sea Level Rise and Superstorms: Evidence From Paleoclimate Data, Climate Modeling, and Modern Observations That 2 °C Global Warming Could Be Dangerous*, Atmos. Chem. Phys., 16, 3761–3812, doi:10.5194/acp-16-3761-2016, available at <http://www.atmos-chem-phys.net/16/3761/2016/> [hereinafter *Ice Melt*].

⁵ See *Dangerous Climate Change*.

unabated – adds an additional element of immediacy to what, for too long, has been treated in practical terms as, at best, a distant but growing complication.⁶

15. I outline and summarize these matters here, before proceeding to a further explanation of them.

16. **First**: Human burning of fossil fuels has disrupted Earth's energy balance. In response, the planet is heating up – with no end in sight, unless we alter our present path. Atmospheric CO₂ concentration, for example, is now at its highest level in 3 million years, and global surface temperatures now have reached the prior maximum of the Holocene era, the period of relatively moderate climate that, over the last 10,000 years, enabled civilization to develop.

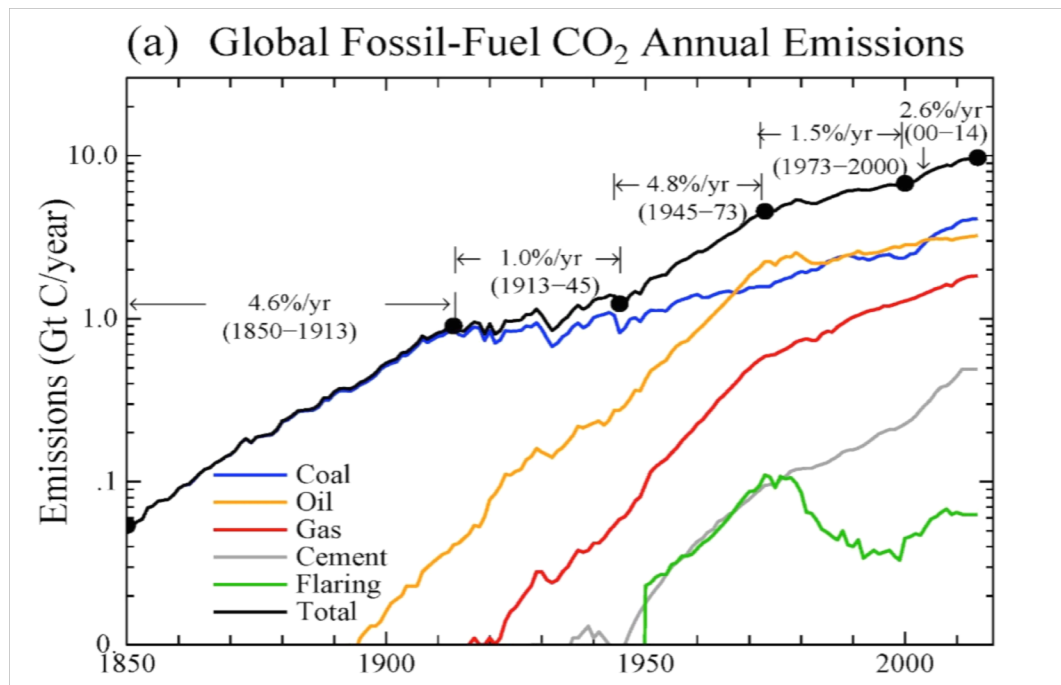
17. **Second**: We are observing impacts of the relatively small amount of warming that has already occurred, and these constitute harbingers of far more dangerous change to come. We can discuss the observable consequences, and their implications, but the key point is that, if unabated, continued carbon emissions will initiate dynamic climate change and effects that spin out of human control, as the planet's energy imbalance triggers amplifying feedbacks and the climate and biological systems pass critical tipping points. Sea-level rise provides a key metric here.

18. **Third**: There is still time and opportunity to preserve a habitable climate system—if we pursue a rational course. I will outline the glide path that we think remains feasible, though further delay in taking effective action will consign that effort to failure. Objectively, then, the situation is urgent and what governments and other decision-makers around the world do today, or fail to do tomorrow, so as to reduce carbon pollution matters immensely.

II. **OUR PLANET IS NOW OUT OF ENERGY BALANCE**

⁶ *See Ice Melt.*

19. In Chart 1, we show global fossil fuel CO₂ emissions on an annual basis from the burning of coal, oil, and natural gas, and from cement production and flaring, along with the total emissions from these major sources. Although it is more than twenty-three years since 170 nations agreed to limit fossil fuel emissions in order to avoid dangerous human-made climate change, the stark reality – as illustrated here – is that global emissions have accelerated. Specifically, the growth rate of fossil fuel emissions increased from 1.5%/year during 1973–2000 to 2.6%/year in 2000–2014 (Chart 1(a)), due in the main to increased utilization of coal, oil, gas and cement (Chart 1(b)).



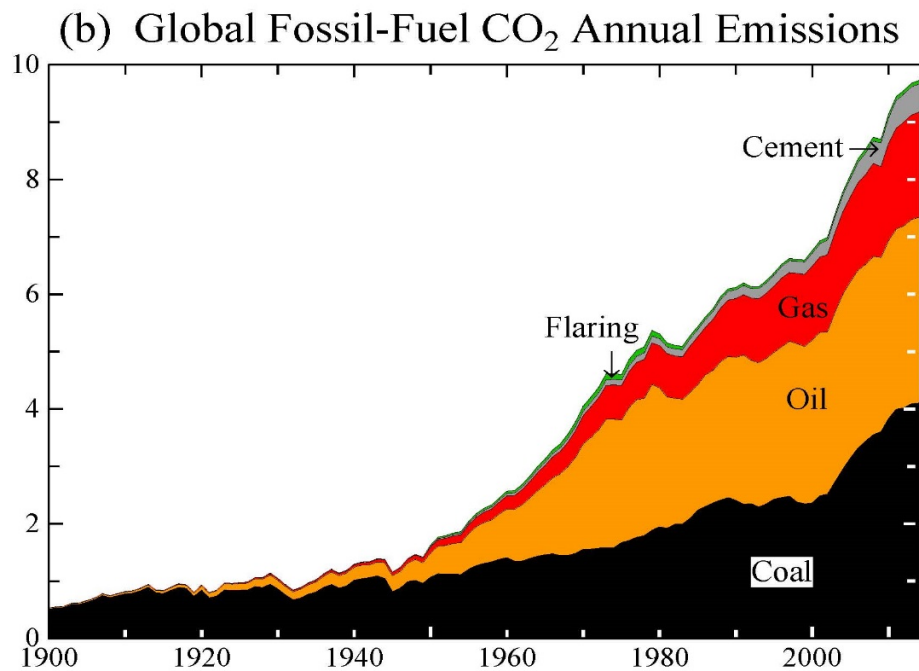


Chart 1: CO₂ Annual Emissions From Fossil Fuel Use And Cement Manufacture

Source: *Dangerous Climate Change*, at Fig. 1, updated through 2014 from <http://www.columbia.edu/~mhs119/CO2Emissions/>.

20. Our increased emissions are reflected, at least in part, in the rising concentration of atmospheric CO₂, as is illustrated in Chart 2⁷ that is based on readings taken at the Mauna Loa, Hawaii, observatory. The CO₂, atmospheric level now exceeds 400 ppm, over 40 percent more than the preindustrial level.

⁷ From http://www.esrl.noaa.gov/gmd/ccgg/trends/#mlo_growth

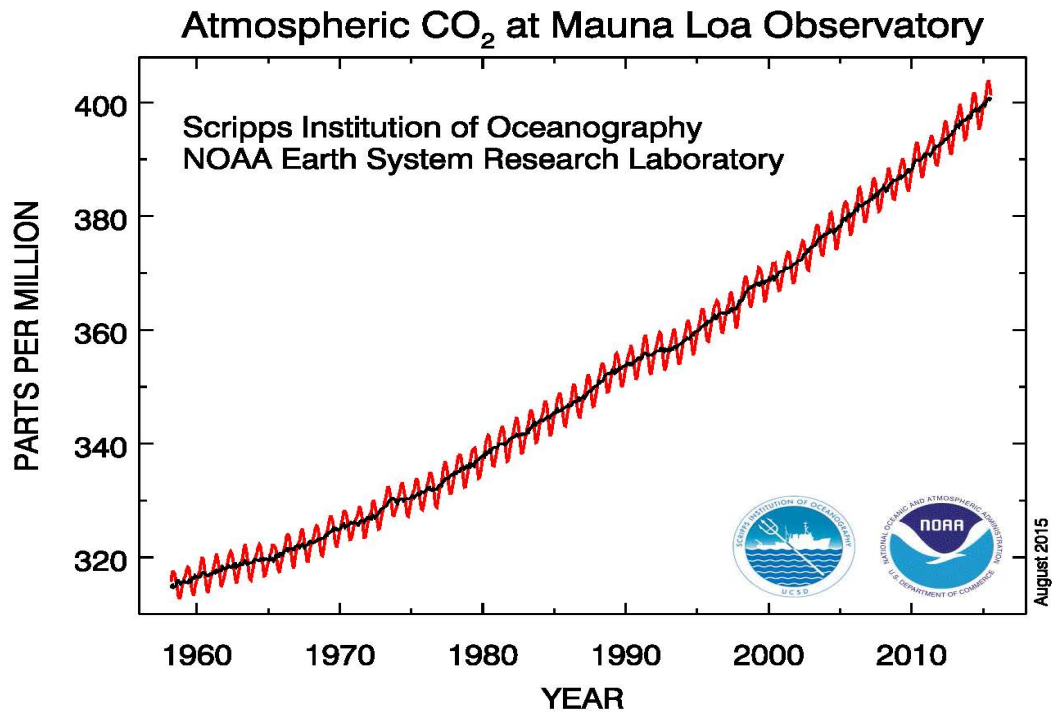


Chart 2: From NOAA's Earth System Research Laboratory
at http://www.esrl.noaa.gov/gmd/ccgg/trends/#mlo_full.

21. Moreover, the *increase* in the atmospheric CO₂ concentration is itself speeding up, as is illustrated in Chart 3.⁸ The annual mean rate of CO₂ growth more than doubled from 0.85ppm in the 1960-70 period to 2.0ppm in 2000-2010.

⁸ *Id.*

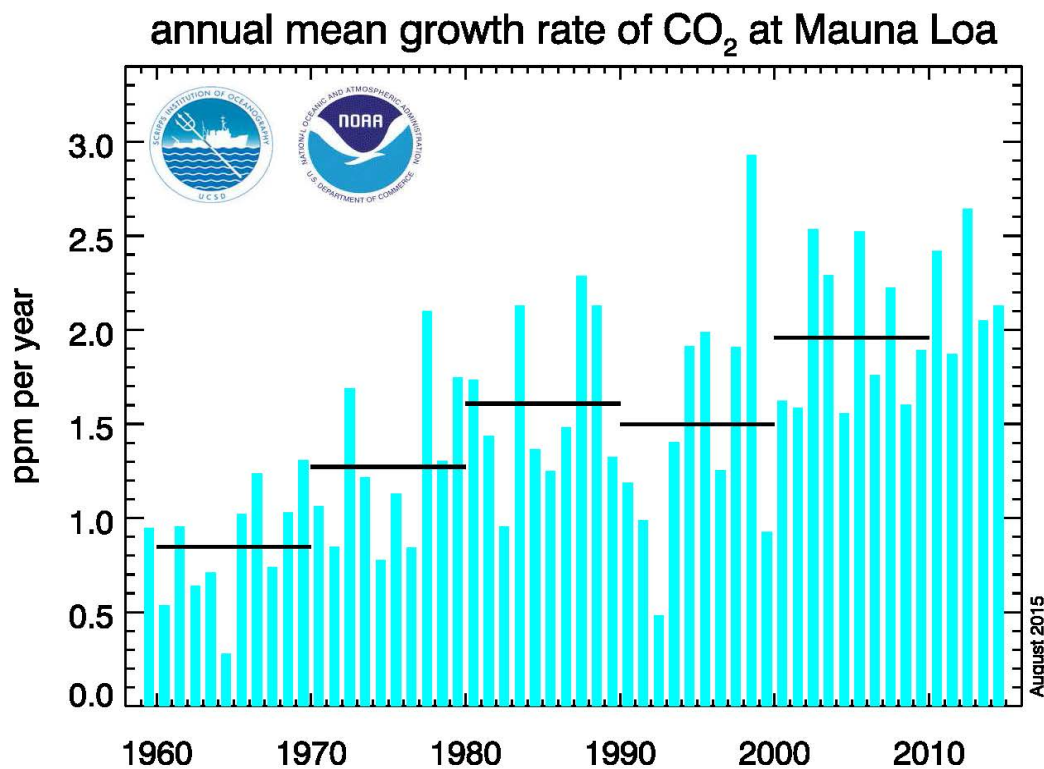


Chart 3: From Noaa's Earth System Research Laboratory
at http://www.esrl.noaa.gov/gmd/ccgg/trends/#mlo_growth.

22. This increased concentration of CO₂ and other GHGs in the atmosphere operates to reduce Earth's heat radiation to space, thus causing an energy imbalance – less energy going out than coming in. This imbalance causes Earth to heat-up until it again radiates as much energy to space as it absorbs from the sun.

23. In point of fact, warming of Earth caused by the increasingly thick CO₂ “blanket” persisted even during the recent five-year solar minimum from 2005-2010. Had changes in insolation been the dominant forcing, the planet would have had a negative energy balance in that period, when solar irradiance was at its lowest level in the period of accurate data, i.e., since the 1970s. Instead, even though much of the greenhouse gas forcing had been expended in causing observed 1°C global warming to date, the residual positive forcing from CO₂ emissions

overwhelmed the negative solar. This illustrates, unequivocally, that it is human activity, and not the sun, that is the dominant driver of recent climate change.

(a) 2013 Annual Emissions (9.9 GtC/yr) (b) 1751–2013 Cumulative Emis. (394 GtC)

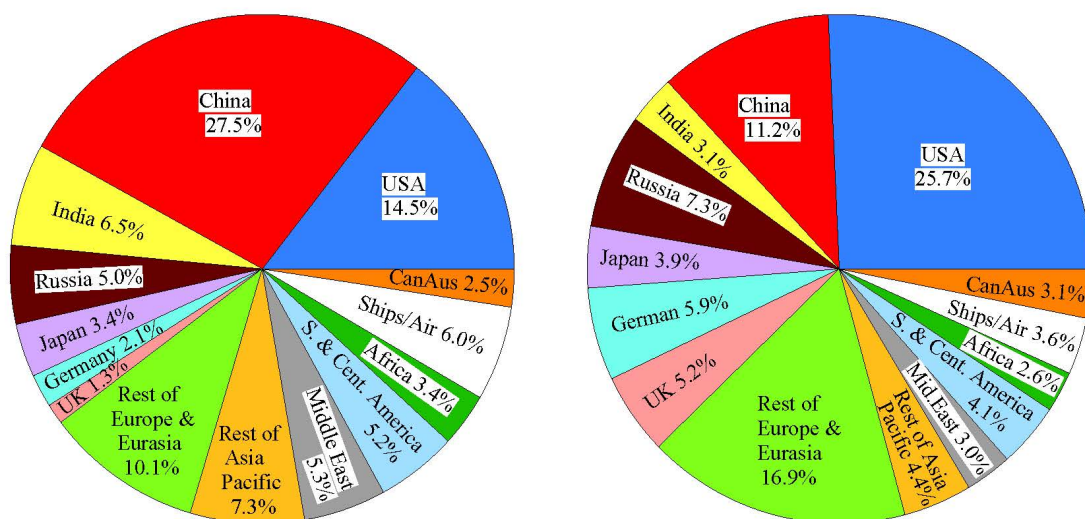


Chart 4: Fossil Fuel CO₂ Emissions

Source: *Dangerous Climate Change*, at Fig. 11.

updated through 2013 at http://www.columbia.edu/~mhs119/CO2Emissions/Emis_moreFigs/.

24. In light of the long residence time of CO₂ following its injection into the atmosphere, it is a sovereign state's sum total of its emissions that is the more proper measure of its responsibility for already-realized and latent climate change. *See* Chart 4(b) (right side). Here, I believe that a further word about the atmospheric residence time of CO₂ is in order, and we can do that with the aid of Chart 5 (left side).

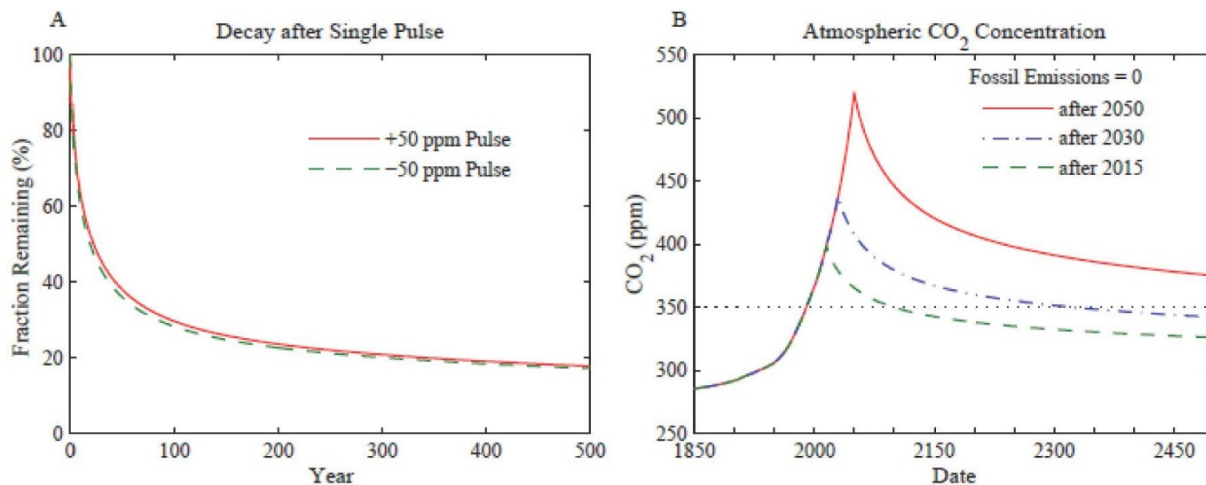


Chart 5: Decay Of Atmospheric CO₂ Perturbations

Source: *Dangerous Climate Change*, at Fig. 4. (A) Instantaneous injection or extraction of CO₂ with initial conditions at equilibrium. (B) Fossil fuel emissions terminate at the end of 2015, 2030, or 2050 and land use emissions terminate after 2015 in all three cases, i.e., thereafter there is no net deforestation.

25. A pulse of CO₂ injected into the air decays by half in about 25 years, as CO₂ is taken up by the ocean, biosphere and soil, but nearly one-fifth remains in the atmosphere after 500 years.

Indeed, that estimate is likely optimistic, in light of the well-known nonlinearity in ocean chemistry and saturation of carbon sinks, implying that the airborne fraction probably will remain larger for a century and more. It requires hundreds of millennia for the chemical weathering of rocks to eventually deposit all of this initial CO₂ pulse on the ocean floor as carbonate sediments.

26. The critical point here is that carbon from fossil fuel burning remains in the climate system, with much of it in the atmosphere, and thus continues to affect the climate system for many millennia.

27. It is in part for this reason – the atmospheric persistence of CO₂ – that the contribution to the problem by developed nations, in particular the United States, is so large. Moreover, we can observe that, the contributions of these major historical emitters to the global climate crisis are not

only disproportionately large in absolute amount (Chart 4(b)), they dwarf the contributions of the most populous developing nations on a per capita basis. Chart 6. Nonetheless, all nations must transition away from fossil fuels if we are to preserve a habitable climate system and protect the rights of children.

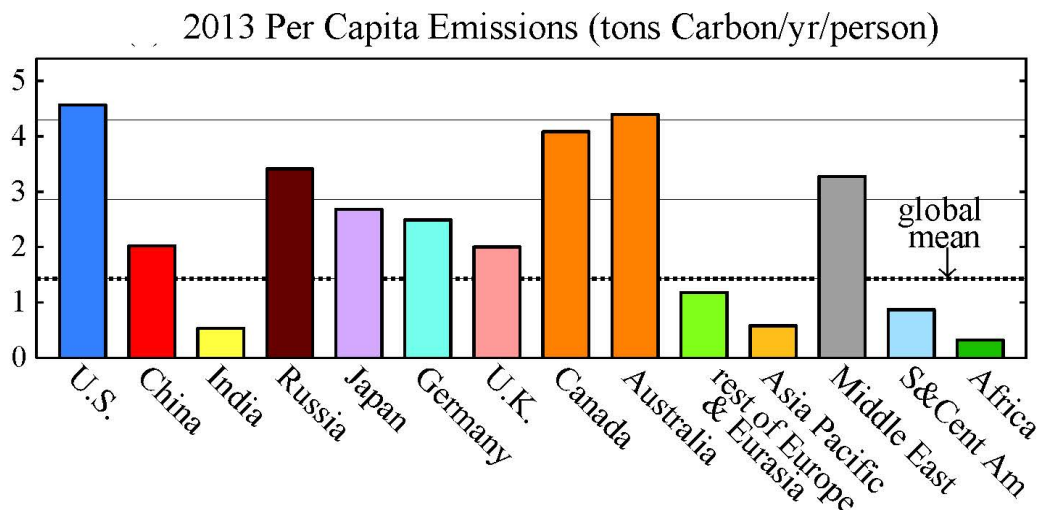
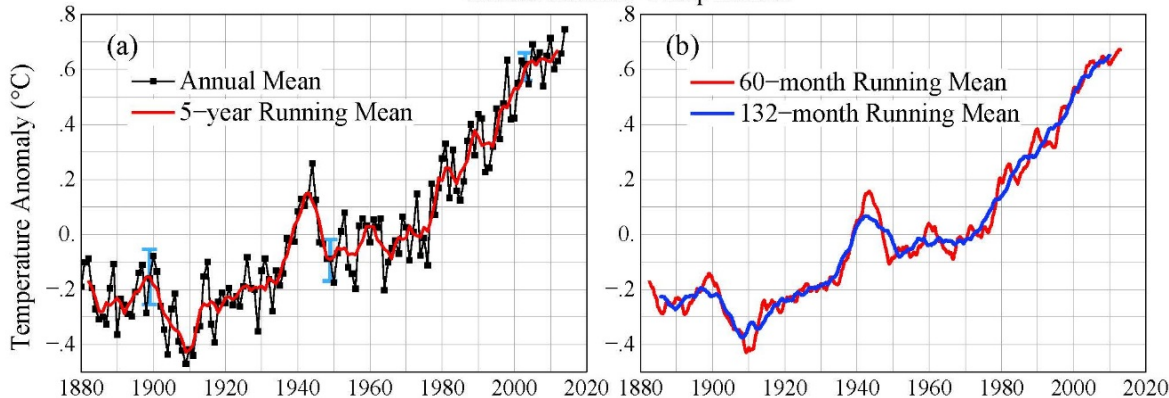


Chart 6: Cumulative Per Capita Carbon Dioxide Emissions

Source: www.columbia.edu/~mhs119/YoungPeople/.

28. Turning, now to Chart 7, we see the upward march of recent global surface temperature.

Chart 7: Global Surface Temperature Anomaly (60-Month And 132-Month Running Means) With A Base Period Of 1951-1980



132-Month Running Means) With A Base Period Of 1951-1980

Source: *Dangerous Climate Change*, at Fig. 3, updated at

<http://www.columbia.edu/~mhs119/Temperature/>.

29. Earth has now warmed about 1°C above the pre-industrial level. That is now close to, and probably slightly above, the prior maximum of the Holocene era – the period of relatively stable climate over the last 10,000 years that has enabled human civilization to develop.

30. The warming increases Earth’s radiation to space, thus reducing Earth’s energy imbalance. However, because of the ocean’s great thermal inertia, it requires centuries for the climate system to reach a new equilibrium consistent with a changed atmospheric composition. The planet’s energy imbalance confirms that substantial additional warming is “in the pipeline”. That energy imbalance is now measured by an international fleet of more than 3,000 submersible floats that plumb the depths of the world’s ocean measuring the increasing heat content.

31. Earth’s energy imbalance now averages about 0.6 Watts/m² [Jim: still 0.6 Watts?] averaged over the entire planet, but I am uncertain whether this conveys the scale of what is going on. I can note that the total energy surplus is 300 trillion joules per second, but that large number may still be insufficiently evocative. Accordingly, it may be more useful to observe, and with equal validity, that Earth’s energy imbalance is equivalent to exploding more than 400,000 Hiroshima atomic bombs per day, 365 days per year. That is how much extra energy Earth is now gaining each day because of our use of the atmosphere as a waste dump for our carbon pollution.

32. We can turn now to Chart 8.

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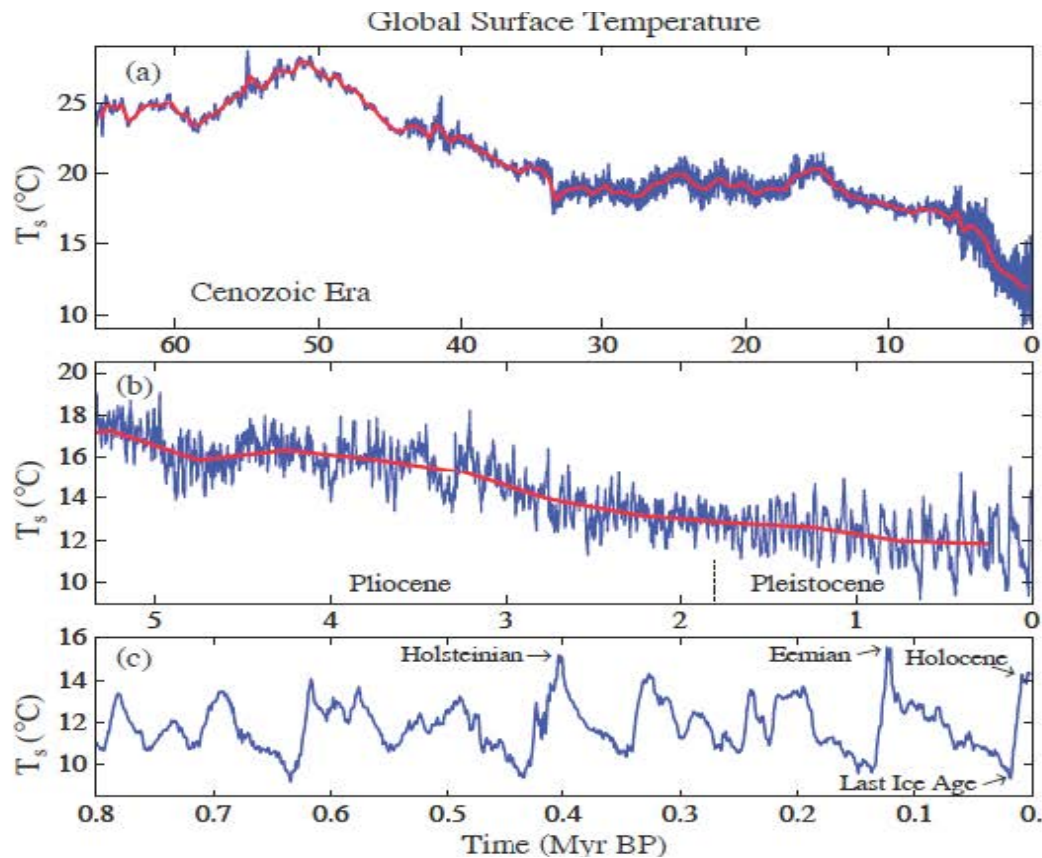


Chart 8: Surface Temperature Estimate for the Past 65.5 Myr, Including An Expanded Time Scale for (B) The Pliocene and Pleistocene and (C) The Past 800 000 Years

Source: J. Hansen, et al, (2013) *Climate Sensitivity, Sea level and Atmospheric Carbon Dioxide*, Phil Trans R Soc A, Fig. 4.

33. Here, we summarize the average global surface temperature record of the last 65 million years. This record is based on high-resolution ice core data covering the most recent several hundred thousand years, and ocean cores on time scales of millions of years. It provides us with insight as to global temperature sensitivity to external forcings such as added CO_2 , and sea level sensitivity to global temperature. It also provides quantitative information about so-called “slow” feedback processes – such as melting ice sheets and lessened surface reflectivity attributable to darker surfaces resulting from melting ice sheets and reduced area of ice.

34. Several relevant conclusions can be drawn. First, the mechanisms that account for the relatively rapid oscillations between cold and warm climates were the same as those operating today. Those past climate oscillations were initiated not by fossil fuel burning, but by slow insolation changes attributable to perturbations of Earth's orbit and spin axis tilt. However, the mechanisms that caused these historical climate changes to be so large were two powerful amplifying feedbacks: the planet's surface albedo (its reflectivity, literally its whiteness) and atmospheric CO₂.

35. Second, the longer paleoclimate record shows that warming coincident with atmospheric CO₂ concentrations as low as 450 ppm may have been enough to melt most of Antarctica. Global fossil fuel emissions have already driven the atmospheric CO₂ concentration above 400 ppm – up from approximately 280 ppm in the preindustrial era.

36. I conclude that the present level of CO₂ and its warming, both realized and latent, is already in the dangerous zone. Indeed, we are now in a period of overshoot, with early consequences that are already highly threatening and that will rise to unbearable unless action is taken without delay to restore energy balance at a lower atmospheric CO₂ amount. We can turn now to a brief review of the increasingly unacceptable, but still avoidable, consequences.

III. UNABATED EMISSIONS MAY DEVASTATE OUR COASTS, CIVILIZATION AND NATURE AS WE KNOW IT

37. I will start with the ocean, in light of our most recent research.

38. While I have postulated previously that major ice sheet disintegration and resulting sea level rise is likely to be nonlinear in the event of continued high fossil fuel impacts, my concern had been based largely on heuristic grounds. Now, utilizing multiple lines of evidence – including satellite gravity measurement, surface mass balances, and satellite radar altimetry – it

has become clear, regrettably, that ice mass losses from Greenland, West Antarctica and parts of East Antarctica are growing nonlinearly, with doubling times so far this century of approximately 10 years.

39. My colleagues and I expect the growth rate for ice mass loss in Greenland to slow, based on the most recent few years of data, but because of amplifying feedbacks described in our paper we also think it likely that Antarctic ice mass loss will continue to climb exponentially – again, if fossil fuel emissions are not rapidly abated. This prospect alone cries out for urgent national and international action to constrain carbon pollution, considering that complete disintegration of the Totten glacier in East Antarctica could raise sea levels by approximately 6-7m; that ice fronted by the Cook glacier in East Antarctica could add 3-4m of sea rise; and that West Antarctic ice fronted by Amundsen Sea glaciers have the potential to raise sea level an additional 3-4m.⁹

40. The rising seas will combine, in places, including especially in the North Atlantic region, with growing storminess to further threaten low-lying and other coastal regions. The phenomenon is a function not only of a warming atmosphere that renders additional water and energy available to any developing weather event, but also because melting ice sheets increase sea level pressure at middle (relative to polar) latitudes and thereby strengthen temperature gradients, supercharging storms with baroclinic sources. This growing climate chaos will increasingly lash regions within the storms' reach. Persons within these regions who lack discretionary resources to flee and rebuild, or else to relocate, predictably will be among those most severely harmed.

41. Persons situated in low-lying regions therefore will predictably be disproportionately impacted by unarrested global warming. So too will young people and future generations be

⁹ *Ice Melt*, at 3795.

severely harmed. Our children and their progeny will be the ones to experience the full impact of slow feedbacks that, only now, are coming into play, including ice sheet disintegration, as well as changes in the global vegetation distribution, melting of permafrost, and possible release of methane from hydrates on continental shelves. Indeed, sovereign governments around the world are on the verge of collectively imposing an overwhelming burden – intergenerational injustice in the extreme – upon young people and future generations who stand to inherit a climate system that is not at all conducive to their well-being or survival, as guaranteed under the Convention, through no fault of their own.

42. In the light of this and related information, we have concluded that “if GHG emissions continue to grow...[a] multi-meter sea level rise would become practically unavoidable, probably within 50–150 years.”¹⁰ Much of the U.S. eastern seaboard, as well as low-lying areas of Europe, the Indian sub-continent, and the Far East, would then be submerged. *See* Chart 9.¹¹

¹⁰ *Ice Melt*, at 3799. As we’ve noted, “Sea level reached +6–9 m in the Eemian, a time that we have concluded was probably no more than a few tenths of a degree warmer than today.” *Ice Melt*, at 3800.

¹¹ *See also* Climate Central’s “Surging Seas” project at <http://sealevel.climatecentral.org/>.

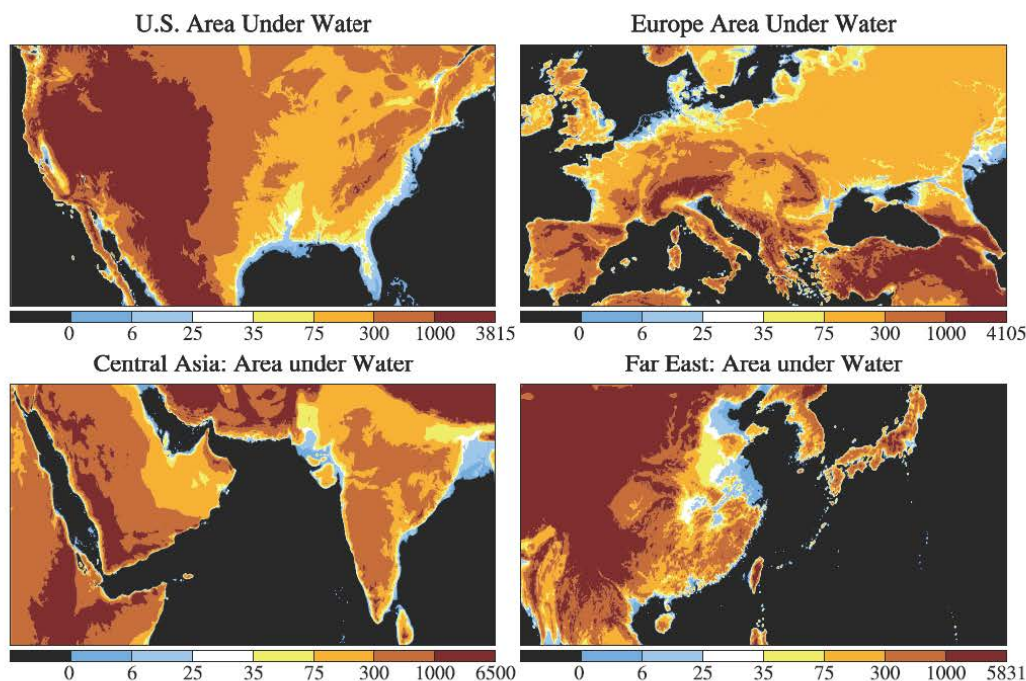


Chart 9: Areas (Light And Dark Blue) That Nominally Would Be Under Water For 6 And 25 M Sea Level Rise

Source: Climate Science, Awareness, and Solutions, Earth Institute, Columbia University (2015).

43. That order of sea level rise would result in the loss of hundreds of historical coastal cities worldwide, with incalculable economic consequences. It would also create hundreds of millions of global warming refugees from highly populated low-lying areas, and thus likely cause or exacerbate major international conflicts.¹²

44. To avoid such a calamity, sea level rise must be recognized as a key limit on any conceivably allowable human-made climate forcing and atmospheric CO₂ concentration, with

¹² In addition, strong temperature gradients caused by ice melt freshening is likely to increase baroclinicity and provide energy for more severe weather events, including in the North Atlantic. This set of circumstances will drive the powerful superstorms of our future. Some of these impacts are beginning to occur sooner in the real world than in our climate model. *See Ice Melt*, at 3773.

fossil fuel emissions and land use changes constrained accordingly.¹³ As discussed, ice sheet melting has now commenced even though global warming to date measures “only” 1°C above the pre-industrial period. This is consistent with the relevant paleoclimate evidence showing a multi-meter rise in sea level in the late Eemian period, approximately 125K years ago, when temperature was at most ~2°C warmer than pre-industrial climate (at most ~1°C warmer than today). This, in itself, and quite apart from the additional harm to terrestrial systems that must also be considered, implies that national and international goals and targets that aim to limit global warming to no more than 2°C run an unacceptably high risk of global catastrophe.

45. An important effect for the coming period of large scale ice sheet melting, in our view, is that the discharge of ice and cold fresh water will expand sea ice cover and result in ocean surface, regional and global cooling effects.¹⁴ For varying periods, these effects would mask some of the global warming that would otherwise result from projected high CO₂ levels. The temporary surface cooling, however, would coincide with a further increase in the planet’s energy imbalance, with added energy pumped into the ocean, and there be available, at Antarctica and Greenland, to further melt the subsurface shelves that, at present, restrain several of the planet’s major ice sheets at their grounding lines.¹⁵

46. Upon cessation of ice sheet disintegration and freshwater discharge, global temperature will recover – with the time period for such recovery depending on the amount of ice melt (and

¹³ This is so, as we wrote in *Ice Melt*, since the “[s]ocial disruption and economic consequences of [multi-meter] sea level rise, and the attendant increases in storms and climate extremes, could be devastating. It is not difficult to imagine that conflicts arising from forced migrations and economic collapse might make the planet ungovernable, threatening the fabric of civilization.” *Ice Melt*, at 3799.

¹⁴ *Ice Melt*, at 3761-3780

¹⁵ *Ice Melt*, at 3776-3777.

sea level rise), and with geographical, geophysical and oceanic circulation factors detailed in our recent study.¹⁶

47. With respect to other important natural and human systems, to which I will now turn, the impacts of global warming – including the renewed warming – will depend in part on the magnitude of Earth’s energy imbalance, and that, in turn, will be controlled by the level of excess atmospheric CO₂. As I have noted already, global warming to date measures “only” 1°C above the pre-industrial period, and yet, that level of warming has already begun to have a widespread effect on natural and human systems, including the safety and well-being of children.

48. For example, mountain glaciers, the source of fresh water to major world rivers during dry seasons, are receding rapidly all around the world. Glaciers in North America’s iconic Glacier National Park, for example, appear to be in full retreat: In 1850, according to the U.S. National Park Service, the park had 150 glaciers measuring larger than twenty-five acres. Today, it has just twenty-five. Significant glacial retreat has also been observed throughout the Rockies and in many other regions including the Cascades, the Alps, the Pyrenees, the Himalayas, the Andes, Greenland, Iceland, and Siberia.

49. As well, tropospheric water vapor and heavy precipitation events have increased, as we would expect. A warmer atmosphere holds more moisture, thus enabling precipitation to be heavier and cause more extreme flooding. Higher temperatures, on the other hand, increase evaporation and can intensify droughts when they occur, as can the expansion of the subtropics that occurs as a consequence of global warming.

¹⁶ *Ice Melt*, at 3766.

50. Coral reef ecosystems, harboring more than 1,000,000 species as the “rainforests” of the ocean, are impacted by a combination of ocean warming, acidification from rising atmospheric CO₂, and other human-caused stresses, resulting in a 0.5-2% per year decline in geographic extent.

51. With respect to rising temperatures, global warming of recent decades has been sufficient to shift the bell curve distribution of temperature anomalies (in units of standard deviation) above the climatological base period of 1951-1980 for the aggregate areas of the northern hemisphere as well as that of the southern hemisphere. This is true for most large sub-hemisphere geographical regions as well.

52. For instance, the summer bell curves for the United States and North and Central Europe are shifted more than one standard deviation (1σ).¹⁷ That shift is enough to increase the frequency of summers warmer than $+2\sigma$ from less than 1 percent to greater than 10 percent. Even larger temperature distribution shifts are observed for the period 2005-2015 in China, India, the Mediterranean, the Middle East, the Sahara and Sahel, South-east Asia, and the African rainforest. Within the continental United States, large summer warming has been experienced in much of the western region and, to a somewhat lesser but still significant extent, along the eastern seaboard. The large warming and dry conditions over the period exacerbated wildfire in the western United States, and I anticipate worse to come with continued global warming.

53. Subtropical climate belts have expanded, contributing to more intense droughts, summer heat waves, and devastating wildfires. Further, summer mega-heat-waves, such as those in Europe in 2003, the Moscow area in 2010, Texas and Oklahoma in 2011, Greenland in 2012, Australia in 2013, Australia and California in 2014, and India, France and Spain in 2015, have

¹⁷ The shift in the winter is only about half of a standard deviation.

become more widespread.¹⁸ 2016 is set to break all previous temperature records. The probability of such extreme heat events has increased by several times because of global warming, and the probability will increase even further if fossil fuel emissions continue to be permitted, so that global warming becomes locked in or rendered increasingly severe.

54. Wildfire frequency and magnitude will climb in ensuing decades if CO₂ emissions are not rapidly phased out, but I observe here, on the basis of research that colleagues and I have recently completed, that such infernos may not prove to be the most severe foreseeable climate-driven calamity confronting civilization in coming decades.

55. I have already mentioned the unparalleled calamity that the loss of scores of coastal cities to rapid sea level rise presents to human civilization. But I should mention that many other impacts also will abound.

56. For example, acidification stemming from ocean uptake of a portion of increased atmospheric CO₂ will increasingly disrupt coral reef ecosystem health, with potentially devastating impacts to certain nations and communities. Inland, fresh water security will be compromised, due to the effects of receding mountain glaciers and snowpack on seasonal freshwater availability of major rivers.

57. Other practical consequences include lost work capacity. Agricultural and construction workers in tropical developing countries may be most exposed to increasing heat stress and stroke, but workers in places such as Southeast and Southwest United States and Eastern China will also be affected by increasing temperature and, in places, increased absolute humidity.¹⁹

58. World health experts have concluded with “very high confidence” that climate change already contributes to the global burden of disease and premature death with expansion of

¹⁸ In general, however, local observations of climate (heat) extremes are illustrative of what will occur with the increasing atmospheric CO₂ concentration, but I will caution that other, more stochastic, variables usually will be in play as well.

¹⁹ Generally, as global warming increases, climatologically wet regions, such as the American Southeast, tend to get wetter, and dry regions, such as the American Southwest, tend to get hotter and drier.

infectious disease vectors. Increasing concentrations of CO₂ and associated increased global temperatures will deepen human health impacts from climate change, with children being especially vulnerable. Climate threats to health move through various pathways, including by placing additional stress on the availability of food, clean air, and clean water. Accordingly, unabated climate change will increase malnutrition and consequent disorders, including those related to child growth and development. It will increase death and illness associated with COPD, asthma, and other respiratory distress triggered by worsened allergies. Unabated emissions will also produce other injuries from heat waves; floods, storms, fires and droughts, and it will increase cardio-respiratory morbidity and mortality associated with increased ground-level ozone.

59. With regard to other species, we see that climate zones are already shifting at rates that exceed natural rates of change; this trend will continue as long as the planet is out of energy balance. As the shift of climate zones becomes comparable to the range of some species, the less mobile species will be driven to extinction. According to the UN Panel on Climate Change, with global warming of 1.6°C or more relative to pre-industrial levels, 9-31 percent of species are anticipated to be driven to extinction, while with global warming of 2.9°C, an estimated 21-52 percent of species will be driven to extinction. These temperature/extinction thresholds will not be avoided absent concerted, rational action on carbon emissions.

60. At present, we remain on track to burn a significant fraction of readily available fossil fuels, including coal, oil, natural gas, and tar sands, and so to raise average surface temperature, over time, to far above pre-industrial levels.

61. High global surface temperatures have been recorded previously, in the age of mammals, with some successful adaptation through evolution of higher surface-area-to-mass ratio body types – for example transient dwarfing of mammals and even soil fauna. However, human-made warming is occurring rapidly and will be fully realized in only centuries, as opposed to millennia, thus providing little opportunity for evolutionary dwarfism to alleviate impacts of global

warming. Along with several colleagues, I have been forced to conclude that the large climate change that would result from burning all or most fossil fuels threatens the survival of humanity.

62. All of which brings me to my third point.

IV. RESTORATION OF OUR CLIMATE SYSTEM, AND SO PROTECTION OF OUR FUTURE, IS STILL POSSIBLE, BUT WE MUST ACT WITH REASON, COURAGE, AND NO FURTHER DELAY

63. As I indicated above, the energy imbalance of Earth is about 0.6 W/m^2 . In light of that imbalance, colleagues and I have calculated the level to which atmospheric CO_2 must be drawn down in order to increase Earth's heat radiation to space by the same amount and thus restore energy balance – the fundamental requirement to stabilize climate and avoid further dangerous warming.

64. The measured energy imbalance indicates that atmospheric CO_2 must be reduced to a level below 350 ppm and the long-term average global temperature increase above preindustrial levels must be limited to below 1°C , assuming that the net of other human-made climate forcings remains at today's level. Specification now of a CO_2 target more precise than <350 ppm is difficult due to uncertain future changes of radiative forcing from other gases, aerosols and surface albedo, but greater precision should be feasible during the time that it takes to turn around CO_2 growth and approach the initial 350 ppm target. I give my best expert opinion based upon my decades of study and research that these are the maximum safe levels of CO_2 and temperature increases that would allow for the nations of the world to preserve most of the rights of children as identified in the CRC. These limits may indeed be lower, but they are certainly not higher.

65. Let us return, for a moment, to Chart 5, so as to consider again the question of delay. On the left side of the chart, the long-residence time for atmospheric CO_2 is illustrated. It is reflected

in the length of time it would take to return CO₂ to lower concentrations even if, as indicated on the right side of the chart, fossil fuel emissions were to cease entirely.

66. Of course, an abrupt cessation of all CO₂ emissions, whether this year or in 2030, is unrealistic. Industry, other business, and consumers all need time to retool and reinvest in emission-free options to fossil fuels.

67. Accordingly, we have evaluated emissions reduction scenarios to devise the path that is both technically and economically feasible, while being sufficiently rigorous to constrain the period of “carbon overshoot” and avoid calamitous consequences (greatly accelerated warming, ecosystem collapse, and widespread species extermination). *See* Chart 10.

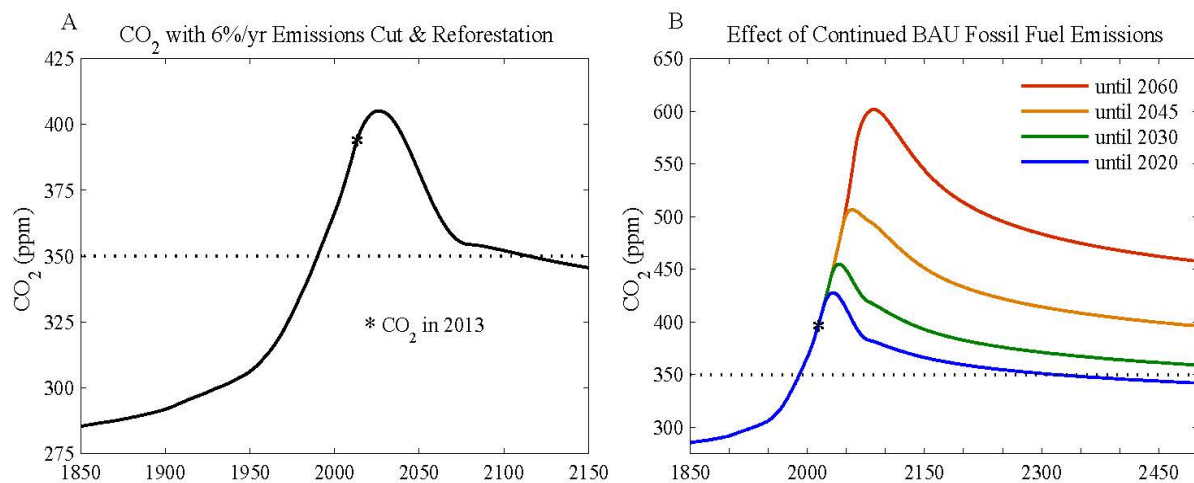


Chart 10: Atmospheric CO₂ If Fossil Fuel Emissions Are Reduced.

(A) 6% Annual Cut Begins In 2013 and 100 GRC Reforestation Drawdown Occurs In 2031-2080,
 (B) Effect Of Delaying Onset Of Emission Reductions.

Source: *Dangerous Climate Change* at Fig. 5.

68. Our analysis prescribes a glide path towards achieving energy balance by the end of the century. It is characterized by large, long-term global emissions reductions (of approximately 7

percent annually if commenced this year, 8 percent if commenced in 2017, and 8.5 percent if commenced in 2018),²⁰ coupled with programs to limit and reverse land use emissions via reforestation and improved agricultural and forestry practices (drawing down approximately 100 GtC globally by the year 2100).

69. These actions could achieve the goal of restoring the atmosphere to approximately 350 ppm within this century if the plan were commenced without delay, and then adhered to. As I have indicated, such action is minimally needed to restore Earth's energy balance, preserve the planet's climate system, and avert irretrievable damage to human and natural systems – including agriculture, ocean fisheries, and fresh water supply – on which human civilization depends. However, consistent with the abrupt phase out scenarios discussed in the prior paragraph, if rapid annual emissions reductions are delayed until 2030, then the global temperature will remain more than 1°C higher than preindustrial levels for about 400 years. Were the emissions cessation only to commence after 40 years, then the atmosphere would not return to 350 ppm CO₂ for nearly 1000 years. Overshooting the safe level of atmospheric CO₂ and the safe range of global ambient temperature for anything approaching these periods will consign succeeding generations to a vastly different, less hospitable planet.

70. Considered another way, the required rate of emissions reduction would have been about 3.5% per year if reductions had started in 2005 and continued annually thereafter, while the required rate of reduction, if commenced in 2020, will be approximately 15% per year.

²⁰ This path assumes that global emissions are held fixed from 2014 (the last year of available historical data) until and including the year before the cuts begin. If we instead assume 2 percent per year emissions increases over the same time periods (for consistency with the scenario in *Dangerous Climate Change*), then the required minimum annual reductions will be marginally higher, at 7.5, 8.2, and 9 percent.

Accordingly, the dominant factor is the date at which fossil fuel emission phase out begins, again presuming the rate of annual emissions reductions thereafter are sustained.

V. TO PRESERVE A STABLE CLIMATE SYSTEM, AVERAGE GLOBAL TEMPERATURE INCREASE MUST BE LIMITED TO LESS THAN 1°C

71. In a 2008 study, *Target Atmospheric CO₂: Where Should Humanity Aim?* nine co-authors and I observed that “[p]aleoclimate evidence and ongoing global changes imply that today’s CO₂, about 385 ppm, is already too high to maintain the climate to which humanity, wildlife, and the rest of the biosphere are adapted.”²¹ We suggested “an initial objective of reducing atmospheric CO₂ to 350 ppm” through a practical strategy, including “a rising global price on CO₂ emissions” and a phase-out of most coal utilization.²²

72. Regrettably, in the intervening 8 precious years since *Target Atmospheric CO₂* was published, governments have dithered – except, in the main, to engage in rancorous debate producing lax and highly-perforated carbon caps, among other small steps – while the concentration of atmospheric CO₂ has shot to, and is now going beyond, 400 ppm.²³

73. The Intergovernmental Panel on Climate Change (IPCC), the international body of scientists that has done so much to bring together climate-relevant information on a six-year basis,²⁴ has neither established nor endorsed a target of 2 °C warming over the preindustrial period as a limit below which the climate system will be stable. It is true that the Parties to the

²¹ Hansen J, Sato M, Kharecha P, Beerling D, Berner R, et al., (2008), *Target Atmospheric CO₂: Where Should Humanity Aim?* The Open Atmospheric Science Journal 2: 217–231, available at <http://benthamopen.com/ABSTRACT/TOASCJ-2-217>.

²² I have published scores of other papers that explore the essential features of Earth’s climate system and detail the need to phase out fossil fuel emissions rapidly so as to preserve those essential features that enabled human civilization to develop. See Exhibit 1 (my CV).

²³ The trends may be usefully explored at the public site of the Earth System Research Laboratory, available at <http://www.esrl.noaa.gov/gmd/ccgg/trends/>.

²⁴ The IPCC lays out its multi-year process leading to the publication of each assessment here: <http://www.climatechange2013.org/ipcc-process/>.

UNFCCC have acknowledged that the rise in global surface temperature must kept to less than 2°C. The important question, of course, is “how much less?” That question is the subject of endless debate within the UNFCCC,²⁵ where delegates jockey over proposed national carbon reduction commitments aimed, alternately, to protect people or major carbon polluters.

74. More importantly, the question also is not answered by the IPCC. In places, the IPCC has been clear about this point, noting, for example, that: “each major IPCC assessment has examined the impacts of [a] multiplicity of temperature changes but has left [it to the] political processes to make decisions on which thresholds may be appropriate.”²⁶

75. Moreover, the most recent IPCC synthesis of climate science strongly confirms that additional warming of 1°C above the preindustrial average jeopardizes unique and threatened systems, including ecosystems and cultures, with certain natural systems and species of limited adaptive capacity considered at “very high risk.”²⁷ The IPCC warns, as well, of risks of extreme

²⁵ That said, at long last a consensus may be emerging, “although it remained for the parties to articulate.” According to a Coordinating Lead Author of the IPCC’s Fifth Assessment Report, at a recent “structured expert dialogue” between parties to the UNFCCC and selected IPCC authors, the 2°C “danger level” seemed “utterly inadequate given the already observed impacts on ecosystems, food, livelihoods, and sustainable development, and the progressively higher risks and lower adaptation potential with rising temperatures, combined with disproportionate vulnerability.” Petra Tschakert, *1.5 °C or 2 °C: a conduit’s view from the science-policy interface at COP20 in Lima, Peru*, Climate Change Responses 2:3, 8 (2015), available at <http://www.climatechangeresponses.com/content/2/1/3>.

²⁶ IPCC, 2014: Climate Change 2014: Mitigation of Climate Change, Contribution of Working Group III to the Fifth Assessment Report at 125, available at http://report.mitigation2014.org/report/ipcc_wg3_ar5_chapter1.pdf.

²⁷ IPCC 2014: Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Cambridge University Press) at 13-14. Available at http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgII_spm_en.pdf.

events – including heat waves, extreme precipitation, and coastal flooding, and “irreversible regime shifts” with additional warming.²⁸ See Chart 11.

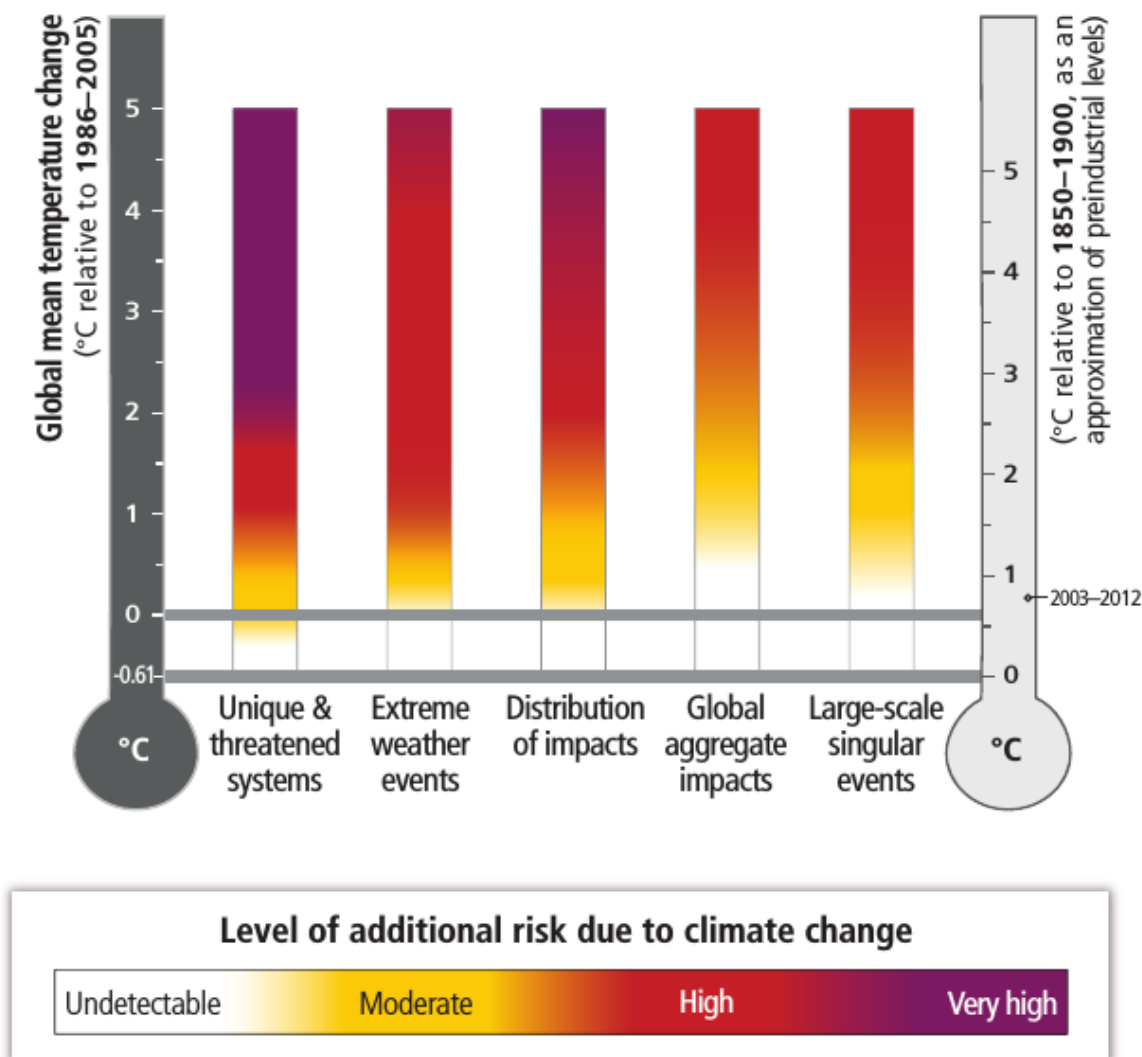


Chart 11 Burning Embers. Illustration of climate risks associated with the IPCC’s principally identified reasons for concern. 5th Assessment Report Summary for Policymakers at 13, available at http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgII_spm_en.pdf.

²⁸ *Id.* The IPCC also warns that risks are and will be “unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development.” *Id.* The IPCC also sees “moderate risk” of global aggregate impacts to our planet’s biodiversity and the overall economy with additional warming of 1-2°C, with “extensive biodiversity loss with associated loss of ecosystem goods and services” and accelerated economic damages for additional warming around 3 °C or above. *Id.*

76. Accordingly, while the IPCC has not expressly stated what level of warming is too dangerous, and it likely never will, the answer is plain enough – even based simply on IPCC syntheses – that 2°C warming will be very dangerous.²⁹ In light of our recent work, I think it is clear that such warming, if maintained (or exceeded) even for decades, will produce calamitous effects to human and natural systems alike.

VI. THE “COMMITMENTS” MADE AT COP-21

77. The largely precatory agreement secured in December 2015 at the Conference of the Parties to the UNFCCC (COP-21) neither resolves nor ameliorates the unfolding crisis of dangerous, human-caused disruption of the climate system.

78. By the time COP-21 commenced on November 30, 2015, most nations – including all of the so-called “G20 nations”³⁰ responsible for nearly 80% of global emissions – had presented their “intended nationally determined contributions” (“pledges”) to the UNFCCC.

79. Independent analysis of the major nations’ pledges heading into COP-21 established that, when taken together, there remained a large gap between the aggregate emissions that would be allowed (even assuming that pledges constituted binding commitments) and the level of action, in terms of actual emissions reductions, required to hold global warming below 2°C.³¹

²⁹ For example, Professor Mann of Pennsylvania State University, argued in 2009 that, given the risks to threatened systems, risks associated with extreme weather, and the “distribution of impacts [that may] weigh heavily toward being adverse across diverse regions at ~1 °C additional global mean warming (defined relative to a 1990 baseline), it would seem difficult for the risk averse among us to accept anything much above that as the standard” for dangerous anthropogenic interference with the climate system. Michael E. Mann, (2009), *Defining dangerous anthropogenic interference*, Proceedings of the National Academic of Sciences, 4065, available at <http://www.pnas.org/content/106/11/4065.full.pdf>.

³⁰ The G20 is comprised of Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom, and the United States.

³¹ See, for example, Climate Action Tracker, *Update: G20 – all INDCs in, but large Gap remains*, Nov. 13, 2015, available at http://climateactiontracker.org/assets/publications/briefing_papers/G20_gap.pdf.

80. It was therefore unsurprising that in its decision to adopt the Paris Agreement, the Conference of the Parties emphasized the Parties’ “serious concern” with “the significant gap between the aggregate effect of Parties’ mitigation pledges” and what is required to preserve the planet.³²

81. In that regard, in adopting the Paris Agreement, the Parties properly took “note of the synthesis report on the aggregate effect of intended nationally determined contributions.”³³ That synthesis report, in turn, states, among other things, that even if the nations’ announced targets were to be “exactly met” then “global emissions are *likely to increase until 2030*.”³⁴

82. Based on my experience and applying my scientific judgment, and consistent with the judgment of numerous other climate scientists, it is clear that allowing global CO₂ emissions to *increase* for another 15 years would likely consign future generations to a far different, largely unrecognizable, planet, one marked in vast reaches by unbearable summer heat, ecological collapse, species extinction, widespread famine, coastal cities lost to rising seas, mass human migration, and riven national and international conflict. That list is but a start of what probably will occur. Such an unappealing, but increasingly likely, scenario is outlined above. In that light, then, the Parties to the Paris Agreement were understated in noting “*with concern* that the estimated aggregate greenhouse gas emission levels in 2025 and 2030 resulting from the intended nationally determined contributions do not fall within least-cost 2°C scenarios.”³⁵

83. Also as discussed above, based on multiple lines of inquiry, including analysis of the paleoclimate record, my colleagues and I have concluded that dangerous disruption of current

³² See UNFCCC, Adoption of the Paris Agreement, FCCC/CP/2015/10/Add.1, at 2, Dec. 12, 2015, available at <http://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf>.

³³ *Id.* at 4.

³⁴ UNFCCC, *Synthesis Report on the Aggregate Effect of the Intended Nationally Determined Contributions*, FCCC/CP/2015/7, at 41, par. 193, Oct. 30, 2015 (emphasis added), available at <http://unfccc.int/resource/docs/2015/cop21/eng/07.pdf>.

³⁵ Adoption of the Paris Agreement at 3, par. 17.

climate system to which humanity is adapted likely will commence shy of the politically-driven 2°C warming target.³⁶

84. Moreover, the Parties to the Paris Agreement did not agree to any binding commitments, and instead, only announced intentions and precatory exhortations to do more. These intentions and exhortations do not amount to binding, enforceable, emissions reduction commitments. As a result, the Paris Agreement – even if it encourages additional nationally-determined emissions reduction pledges – cannot provide genuine assurance that even the inadequate 2°C target will be attained and not blown.

85. Accordingly, the substantive utility of the Paris Agreement must reside in the unanimous acknowledgment by the Parties, including the major emitters, that their emissions reduction programs and pledges to date fall short of what is minimally required to preserve the fundamental features of a viable planet. Indeed, even assuming that the pledges made by governments of the world are converted to binding programs, the total efforts will fall short of a fair contribution even to halting global warming at 2°C, a target that is itself so lacking in ambition that, even if secured, would be unlikely in the long run to stave off catastrophic change.³⁷

VII. THE FUNDAMENTAL HUMAN RIGHTS OF CHILDREN AND FUTURE GENERATIONS TO A HABITABLE PLANET

³⁶ See, for example, *Ice Melt*, at 3801, where we conclude that “2°C global warming is dangerous” and that there is a “real danger” that “we will hand young people and future generations a climate system that is practically out of their control.”

³⁷ See *supra*, Section VI. Further, based on my review of the paleoclimate record, among other factors, I am forced to conclude that, if sea level rise adds to migration pressures from regional climate change, the world could become nearly ungovernable even with global warming of “only” 2°C. On that point see, for example, our recent comprehensive assessment concluding that “[f]ossil fuel emissions of 1000 GtC, sometimes associated with a 2°C global warming target, would be expected to cause large climate change with disastrous consequences.” *Dangerous Climate Change*, at 13.

86. With all of the above having now been said, and serving as background, I can return, finally, and briefly, to consider the nature of the violations of the fundamental human rights of children and future generations that are properly attributable to the continued permitting, leasing, and other support for fossil fuel exploitation and expansion projects, as well as deforestation, by governments around the world, particularly in the absence of any countervailing, coherent, effective international programs to rapidly reduce atmospheric CO₂ to a safe level which, as discussed above, requires at least 8.5 percent annual emissions reductions, commenced in 2018, coupled with massive global reforestation to return atmospheric CO₂ to below 350 ppm and limit long-term global heating to no more than 1°C.³⁸

87. In this failure of governments to cease actions engendering additional emissions and to take immediate and concrete steps to reduce emissions, governments around the world, through their actions and inactions, are ensuring a further increase in the atmospheric concentration of CO₂, and thus a further increase of Earth's energy imbalance – *thereby driving our planet towards and potentially beyond irretrievable climate system tipping points*.

88. This is so because, by exacerbating or locking-in Earth's energy imbalance, such government action and inaction jeopardizes the signal features of the relatively benign and favorable climate system that, over the last 10,000 years, enabled civilization to develop and nature to thrive, as I have discussed. These features included relatively stable coastlines, moderate weather, fertile soils, and dependable hydrological systems – the natural capital on which the lives of young people depend no less than did the lives of their parents and *their* forebears.

³⁸ See *supra*, ¶68.

89. The resulting diminution of young people's life prospects and ability to exercise their human rights – their compromised ability to earn a living, to meet their basic human needs, to safely raise families, to practice their religious and spiritual beliefs, and otherwise to lead dignified lives – is a predictable if not intended result. In addition, where such government action exacerbates or locks-in Earth's energy imbalance, that, in turn, predictably will lead to the climate change-driven inundation, burning, or other destruction of property in which young people and their families hold interests.

90. Government action that allows the continued increase of atmospheric CO₂ levels, and the consequential long-term impacts on Earth's climate system and the thermal inertia of the ocean, will disproportionately impose harsh burdens on youth and future generations. If fossil fuel emissions are not systematically and rapidly abated, as I have discussed above – including in the materials that I have incorporated by reference – then youth and future generations will confront what reasonably only can be described as, at best, an inhospitable future. That future may be marked by rising seas, coastal city functionality loss, mass migrations, resource wars, food shortages, heat waves, mega-storms, soil depletion and desiccation, freshwater shortage, public health system collapse, and the extinction of increasing numbers of species. That is to mention only the start of it. At this late stage it is important not to sugarcoat the fundamental assault on their basic human rights as articulated in the Convention. While prior and current generations of adults in the developing world have been enriched by the exploitation of fossil fuels, all the world's children and their progeny are now at extreme risk. To be more specific, the continued permitting and promotion of the fossil fuel enterprise by governments now impairs and increasingly will compromise the fundamental natural resources on which youth and future generations will depend. Again, these are the fundamental resources on which the prior and

present generations have relied, and on which youth now and in the future must rely. They include the air, freshwater, the oceans and stable shores, the soil and its agronomic capacity, the forests and its wildlife, biodiversity on earth, and the planet's climate system in a form conducive to civilization, humanity and nature as we know it.

91. Furthermore, it is clear to me that young people's right to governments that retain any significant capacity to address the climate crisis adequately is violated by prior and present actions of governments around the world that exacerbate or lock-in our planet's energy imbalance. In time and, as I have argued, likely within the century, such action will irretrievably damage our planet's favorable climate system. Once begun, for example, collapsing and disintegrating ice sheets will not readily be reformulated – certainly not within a timeframe relevant to present and foreseeable generations. The loss of species too is irretrievable. Many are adapted to specific climate zones, so those species adapted to polar and alpine regions will have no place to run. Present and pending actions by governments now must be viewed in the context of a climate crisis that governments to date have done so much to bring about. Action is required to preserve and restore the climate system such as we have known it in order for the planet as we have known it to be able to continue adequately to support the lives and prospects of young people and future generations. But that cannot be done effectively by future governments if governments currently in power continue to turn a blind eye to a scientifically-defensible standard for CO₂ levels and global warming, and continue to exacerbate the planet's energy imbalance and press our planet towards irretrievable tipping points from which there can be no practical opportunity to return.

92. The rapid growth of coal emissions is both a threat to global climate and a source of hope. If coal can be replaced with carbon-free energy, a huge reduction of global emissions becomes

possible. In view of the responsibility of the major-emitting developed nations for the excess CO₂ in the atmosphere today, it is incumbent upon them not only to rapidly phase out their own fossil fuel emissions, but also to vigorously assist China, India and other rapidly developing nations to replace coal with carbon-free sources of electricity generation.

93. More generally, governments and governing bodies (state, national, and international) need to marshal every available tool, talent, and resource to address and resolve the present crisis with honesty and without further delay.

94. Young people have multiple rights that are guaranteed by national Constitutions, the public trust doctrine, and international agreements—rights that should not be denied without due process. It is the duty of sovereign governments, including every branch of government and every government official, to protect those rights. Specifically, it is a duty of sovereign governments to lead and propose and pursue policies and standards that achieve the required ends, as opposed to ineffectual actions that are demonstrably far short of what is needed.

95. The essential first step, in my view and that of other experts, including economists,³⁹ is an accord establishing a growing price on CO₂ emissions, which would lead over time to their phase-out. Agreement upon such a domestic fee by major emitters, with a border duty on products from nations that do not have an equivalent domestic carbon fee, would be expected to lead to widespread global movement toward carbon-free energies.

³⁹ These include three co-authors of our 2013 PLOS One study. *Dangerous Climate Change*. The United States federal government also has understood the central importance of a rising carbon price, and for at least 25 years. See, e.g., Congressional Office of Technology Assessment, (1991), *Changing by Degrees: Steps To Reduce Greenhouse Gases*, at 15 (“a particularly effective way of targeting the heaviest economic sanctions against the worst emitters of CO₂.”) (http://govinfo.library.unt.edu/ota/Ota_2/DATA/1991/9111.PDF (last visited Aug. 16, 2016). As colleagues and I noted in 2013, *Dangerous Climate Change*, at 19, “[a] rising carbon fee is the *sine qua non* for fossil fuel phase out.”

96. I could go on, but I will end here with a summary statement in the light of the foregoing material that I have outlined and referenced, and with the offer to further explain my views and reasoning if requested.

97. Simply put: The persistent permitting and underwriting of fossil fuel projects by governments of the world serves now to further disrupt the favorable climate system that to date enabled human civilization to develop. In order to preserve a viable climate system, our use of fossil fuels must be phased out as rapidly as is feasible. Only governments can ensure this will be done. Instead, sovereign governments initiate, subsidize and permit fossil fuel infrastructure that would close the remaining narrow window of opportunity to stabilize climate and ensure a hospitable climate and planet for young people and future generations. These projects only allow sovereign governments to shirk their duty of care to their people. Governments' permitting of additional, new, or renewed fossil fuel projects is entirely antithetical to their fundamental responsibility to our children and their posterity. Their fundamental rights now hang in the balance.

98. A rapid transition off fossil fuels would have numerous near-term and long-term social benefits, including improved human health and outstanding potential for job creation. There are, accordingly, reasons beyond the mere avoidance of catastrophe for governments to institute the necessary changes, such as my colleagues and I have repeatedly urged.⁴⁰ But, based on recent history, mere exhortation to voluntary action, whether directed to governments, as discussed above, or to fossil fuel corporations, is unlikely to be effective in time to secure the fundamental interests of young people and future generations.

99. What can be stated with reasonable scientific certainty is that a rapid phase out of fossil fuel emissions by governments around the world, accompanied by widespread improvements in land use aimed to naturally draw down a portion of the excess atmospheric carbon into the terrestrial system, is fully within our technological reach. In *Dangerous Climate Change*, my

⁴⁰ See, for example, *Dangerous Climate Change*.

colleagues and I laid out scientifically defensible global temperature and atmospheric CO₂ concentration targets and suggested a glide path to achieve these targets.

100. It is urgent that governments act to reduce emissions on a trajectory tiered to returning atmospheric CO₂ to below 350 ppm and limiting the long-term average global temperature increase above preindustrial levels to below 1°C. Failure to do so serves only to ruin young people's future and violate their fundamental and inalienable rights.

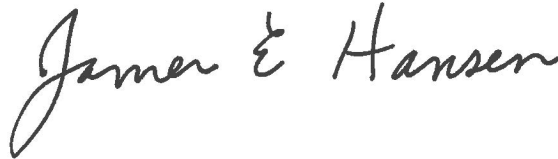
101. Immediate, effective action to restore Earth's energy balance in time to avert wider disintegration of the major ice sheets would achieve multiple benefits, virtually at the same time. These benefits include slowing and eventually stopping sea level rise, averting further acidification of the oceans and consequential disruption of the marine food chain, slowing and in time stemming the loss of terrestrial species, preserving a viable agricultural system, stemming the growth in wildfires, securing essential water resources – the list goes on.⁴¹

102. What must be recognized is that atmospheric CO₂ functions now as the control knob for the planet's climate system. Within the remaining period prior to the full manifestation of slow feedbacks and the crossing of climate tipping points of no return, it remains within the power of the governments around the world to help dial it back so as to secure a viable future for our children and their progeny. At this late stage all sovereign governments must do their part to turn this thing around.

⁴¹ Such action also should avert the feared shutdown of the Atlantic Meridional Overturning Circulation. See James Hansen and Makiko Sato, (2015), *Predictions Implicit in "Ice Melt" Paper and Global Implications*, Sept. 21, 2015 <http://csas.ei.columbia.edu/2015/09/21/predictions-implicit-in-ice-melt-paper-and-global-implications/> (last visited Aug. 16, 2016).

I declare under the penalty of perjury under the laws of the State of Oregon that the foregoing is true and correct.

Signed this 19th day of August, 2016.

A handwritten signature in cursive script that reads "James E. Hansen". The signature is written in black ink and is positioned above a horizontal line.

Dr. James E. Hansen

James E. Hansen

Columbia University Earth Institute, Climate Science, Awareness and Solutions
Interchurch Building, 475 Riverside Drive, Room 239T, New York, NY 10115 jimehansen@gmail.com

1-paragraph bio/introduction:

Dr. James Hansen, formerly Director of the NASA Goddard Institute for Space Studies, is an Adjunct Professor at Columbia University's Earth Institute, where he directs a program in Climate Science, Awareness and Solutions. Dr. Hansen is best known for his testimony on climate change in the 1980s that helped raise awareness of global warming. He is a member of the U.S. National Academy of Sciences and has received numerous awards including the Sophie and Blue Planet Prizes. Dr. Hansen is recognized for speaking truth to power and for outlining actions needed to protect the future of young people and all species on the planet.

1-long-paragraph bio:

Dr. James Hansen, formerly Director of the NASA Goddard Institute for Space Studies, is an Adjunct Professor at Columbia University's Earth Institute, where he directs a program in Climate Science, Awareness and Solutions. He was trained in physics and astronomy in the space science program of Dr. James Van Allen at the University of Iowa. His early research on the clouds of Venus helped identify their composition as sulfuric acid. Since the late 1970s, he has focused his research on Earth's climate, especially human-made climate change. Dr. Hansen is best known for his testimony on climate change to congressional committees in the 1980s that helped raise broad awareness of the global warming issue. He was elected to the National Academy of Sciences in 1995 and was designated by Time Magazine in 2006 as one of the 100 most influential people on Earth. He has received numerous awards including the Carl-Gustaf Rossby and Roger Revelle Research Medals, the Sophie Prize and the Blue Planet Prize. Dr. Hansen is recognized for speaking truth to power, for identifying ineffectual policies as greenwash, and for outlining actions that the public must take to protect the future of young people and other life on our planet.

3-paragraph bio:

Dr. James Hansen, formerly Director of the NASA Goddard Institute for Space Studies, is an Adjunct Professor at Columbia University's Earth Institute, where he directs a program in Climate Science, Awareness and Solutions. He was trained in physics and astronomy in the space science program of Dr. James Van Allen at the University of Iowa, receiving a bachelor's degree with highest distinction in physics and mathematics, master's degree in astronomy, and Ph. D. in physics in 1967. Dr. Hansen was a visiting student, at the Institute of Astrophysics, University of Kyoto and Dept. of Astronomy, Tokyo University, Japan from 1965-1966. He received his Ph.D. in physics from the University of Iowa in 1967. Except for 1969, when he was an NSF post-doctoral scientist at Leiden Observatory under Prof. H.C. van de Hulst, he has spent his post-doctoral career at NASA GISS.

In his early research Dr. Hansen used telescopic observations of Venus to extract detailed information on the physical properties of the cloud and haze particles that veil Venus. Since the mid-1970s, Dr. Hansen has focused on studies and computer simulations of the Earth's climate, for the purpose of understanding the human impact on global climate. He is best known for his testimony on climate change to Congress in the 1980s that helped raise broad awareness of the global warming issue. In recent years Dr. Hansen has drawn attention to the danger of passing climate tipping points, producing irreversible climate impacts that would yield a different planet from the one on which civilization developed. Dr. Hansen disputes the contention, of fossil fuel interests and governments that support them, that it is an almost god-given fact that all fossil fuels must be burned with their combustion products discharged into the atmosphere. Instead Dr. Hansen has outlined steps that are needed to stabilize climate, with a cleaner atmosphere and ocean, and he emphasizes the need for the public to influence government and industry policies.

Dr. Hansen was elected to the National Academy of Sciences in 1995 and, in 2001, received the Heinz Award for environment and the American Geophysical Union's Roger Revelle Medal. Dr. Hansen received the World Wildlife Federation's Conservation Medal from the Duke of Edinburgh in 2006 and was designated by Time Magazine as one of the world's 100 most influential people in 2006. In 2007 Dr. Hansen won the Dan David Prize in the field of Quest for Energy, the Leo Szilard Award of the American Physical Society for Use of Physics for the Benefit of Society, and the American Association for the Advancement of Science Award for Scientific Freedom and Responsibility. In 2008, he won the Common Wealth Award for Distinguished Service in Science and was also awarded both the Ohio State University's Bownocker Medal and the Desert Research Institute's Nevada Medal. In 2009, Dr. Hansen received the American Meteorological Society's Carl-Gustaf Rossby Research Medal. In 2010 he received the Sophie Prize and the Blue Planet Prize.

Additional Information:

<http://www.columbia.edu/~jeh1/>

<http://www.columbia.edu/~mhs119/>

Photos: <http://www.mediafire.com/?8ecel33ccmg81>

Education:

BA with highest distinction (Physics and Mathematics), University of Iowa, 1963

MS (Astronomy), University of Iowa, 1965

Visiting student, Inst. of Astrophysics, University of Kyoto & Dept. of Astronomy, Tokyo University, Japan, 1965-1966

Ph.D. (Physics), University of Iowa, 1967

Research Interests:

Analysis of the causes and consequences of global climate change using the Earth's paleoclimate history, ongoing global observations, and interpretive tools including climate models. Connecting the dots all the way from climate observations to the policies that are needed to stabilize climate and preserve our planet for young people and other species.

Professional Employment:

1967-1969 NAS-NRC Resident Research Associate: Goddard Institute for Space Studies (GISS), NY

1969 NSF Postdoctoral Fellow: Leiden Observatory, Netherlands

1969-1972 Research Associate: Columbia University, NY

1972-1981 Staff Member/Space Scientist: Goddard Institute for Space Studies (GISS), Manager of GISS Planetary and Climate Programs

1978-1985 Adjunct Associate Professor: Department of Geological Sciences, Columbia University

1981-2013 Director: NASA Goddard Institute for Space Studies

1985-present Adjunct Professor: Earth and Environmental Sciences, Columbia University

2013-present Director: Program on Climate Science, Awareness and Solutions, Columbia University

Project Experience:

1971-1974 Co-Principal Investigator AEROPOL Project (airborne terrestrial infrared polarimeter)

1972-1985 Co-Investigator, Voyager Photopolarimeter Experiment

1974-1994 Principal Investigator (1974-8) and subsequently Co-Investigator, Pioneer Venus Orbiter Cloud-Photopolarimeter Experiment

1977-2000 Principal Investigator, Galileo (Jupiter Orbiter) Photopolarimeter Radiometer Experiment

Teaching Experience:

Atmospheric Radiation (graduate level): New York Univ., Dept. of Meteorology & Oceanography

Intro. to Planetary Atmospheres & Climate Change: Columbia Univ., Dept. of Geological Sciences

Awards:

1977 Goddard Special Achievement Award (Pioneer Venus)

1978 NASA Group Achievement Award (Voyager, Photopolarimeter)

1984 NASA Exceptional Service Medal (Radiative Transfer)

1989 National Wildlife Federation Conservation Achievement Award

1990 NASA Presidential Rank Award of Meritorious Executive

1991 University of Iowa Alumni Achievement Award

1992 American Geophysical Union Fellow

1993 NASA Group Achievement Award (Galileo, Polarimeter/Radiometer)

1996 Elected to National Academy of Sciences

1996 GSFC William Nordberg Achievement Medal

1996 Editors' Citation for Excellence in Refereeing for Geophysical Research Letters

1997 NASA Presidential Rank Award of Meritorious Executive

2000 University of Iowa Alumni Fellow

2000 GISS Best Scientific Publication (peer vote): "Global warming – alternative scenario"

2001 John Heinz Environment Award

2001 Roger Revelle Medal, American Geophysical Union

2004 GISS Best Scientific Publication (peer vote): 'Soot Climate Forcing'

2005	GISS Best Scientific Publication (peer vote): 'Earth's Energy Imbalance'
2006	Duke of Edinburgh Conservation Medal, World Wildlife Fund (WWF)
2006	GISS Best Scientific Publication (peer vote): 'Global Temperature Change'
2006	<i>Time Magazine</i> designation as one of World's 100 Most Influential People.
2007	Laureate, Dan David Prize for Outstanding Achievements & Impacts in Quest for Energy
2007	Leo Szilard Award, American Physical Society for Outstanding Promotion & Use of Physics for the Benefit of Society
2007	Haagen-Smit Clean Air Award
2008	American Association for the Advancement of Science Award for Scientific Freedom and Responsibility
2008	Nevada Medal, Desert Research Institute
2008	Common Wealth Award for Distinguished Service in Science
2008	Bownocker Medal, Ohio State University
2008	Rachel Carson Award for Integrity in Science, Center for Science in the Public Interest
2009	Carl-Gustaf Rossby Research Medal, American Meteorological Society
2009	Peter Berle Environmental Integrity Award
2010	Sophie Prize for Environmental and Sustainable Development
2010	Blue Planet Prize, Asahi Glass Foundation
2011	American Association of Physics Teachers Klopsteg Memorial Award for communicating physics to the general public
2011	Edinburgh Medal from City of Edinburgh, Edinburgh Science Festival
2012	Steve Schneider Climate Science Communications Award
2012	<i>Foreign Policy</i> designation as one of its Top 100 Global Thinkers
2013	Ridenhour Courage Prize
2013	NASA Distinguished Service Medal
2014	Center for International Environmental Law's Frederick R. Anderson Award for Outstanding Contributions to Addressing Climate Change
2014	Walker Prize, Museum of Science, Boston

Publications:

- Taylor, L.L., J. Quirk, R.M.S. Thorley, P.A. Kharecha, J. Hansen, A. Ridgwell, M.R. Lomas, S.A. Banwart, D.J. Beerling, 2016: [Enhanced weathering strategies for stabilizing climate and averting ocean acidification](#). *Nature Climate Change*, **6**, 402-406. doi:10.1038/NCLIMATE2882.
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CERTIFICATE OF SERVICE

I hereby certify that on September 12, 2016, I filed a true and correct copy of the foregoing document with the Clerk of the Court using the CM/ECF system, which will automatically generate service to the following counsel of record:

JULIA OLSON (OR Bar 062230) JuliaAOlson@gmail.com
WILD EARTH ADVOCATES
1216 Lincoln Street
Eugene, OR 97401
Tel: (415) 786-4825

DANIEL M. GALPERN (OR Bar 061950) dan.galpern@gmail.com
LAW OFFICES OF DANIEL M. GALPERN
1641 Oak Street
Eugene, OR 97401
Tel: 541-968-7164

JOSEPH W. COTCHETT jcotchett@cpmlegal.com
PHILIP L. GREGORY (pro hac vice) pgregory@cpmlegal.com
PAUL N. MCCLOSKEY pmccloskey@cpmlegal.com
COTCHETT, PITRE & MCCARTHY, LLP San Francisco Airport Office Center
840 Malcolm Road
Burlingame, CA 94010
Tel: 650-697-6000
Fax: 650-697-0577

Attorneys for Plaintiffs

SEAN C. DUFFY
U.S. Department of Justice Environment & Natural Resources Division
P.O. Box 7611
Washington, DC 20044
Tel: 202-305-0445
Fax: 202-305-0506
Email: sean.c.duffy@usdoj.gov

Attorney for Federal Defendants

BENJAMIN E. TANNEN
Email: btannen@sidley.com
QUIN M. SORENSON
Email: qsorensen@sidley.com
ROGER R. MARTELLA, JR.

rmartella@sidley.com
Sidley Austin LLP
1501 K Street, NW
Washington, DC 20005
Tel: 202-736-8574
Fax: 202-736-8711

C. MARIE ECKERT
Miller Nash Graham & Dunn LLP
111 SW Fifth Avenue
Suite 3400
Portland, OR 97204
Tel: 503-205-2477
Fax: 503-224-0155 Email: marie.eckert@millernash.com

Attorneys for Intervenors-Defendant

Respectfully submitted,

/s/ Travis Eiva
Travis Eiva (OR Bar 052440)
Zemper Eiva Law LLC
101 East Broadway, Suite 303
Eugene, OR 97401
travis@zempereiva.com
Tel: 541-636-7480

*Attorneys for Amici Curiae
League of Women Voters of the United
States and
League of Women Voters of Oregon*